

GUIDE

TO THE

Blackmore **M**useum,

SALISBURY.

BY

EDWARD T. STEVENS,

Hon. Curator of the Blackmore Museum.



LONDON :

BELL & DALDY, YORK STREET, COVENT GARDEN.

SALISBURY : BROWN & CO., AND F. A. BLAKE.

TWO SHILLINGS AND SIXPENCE.

Plan of Cases in the Blachmore Museum.

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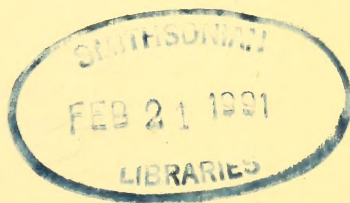
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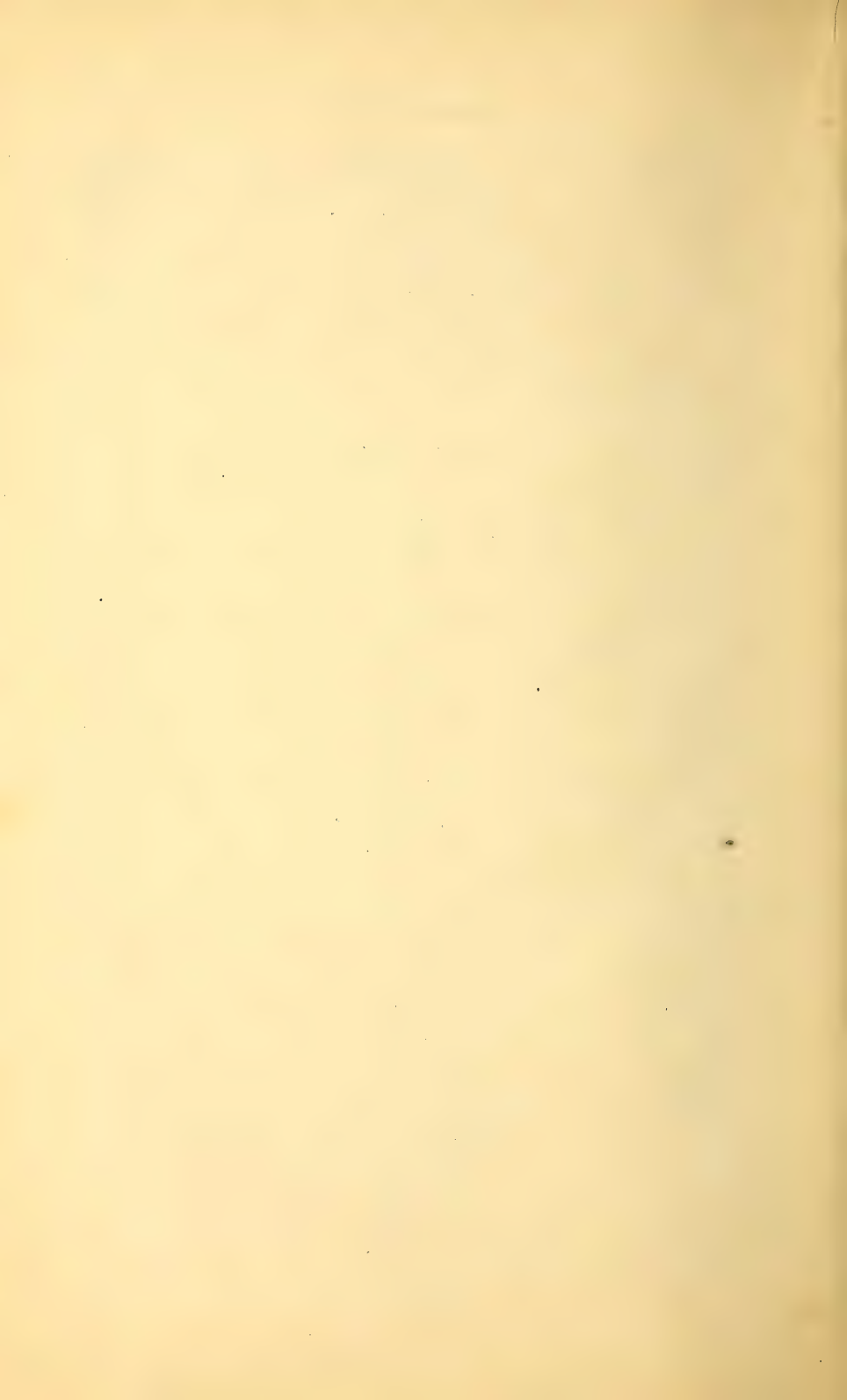
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Rules of the Blackmore Museum.

RULE I.

THIS Museum shall be called the "BLACKMORE MUSEUM," having been established by Mr. WILLIAM BLACKMORE, of Liverpool and London, at whose expense solely it will be maintained.

RULE II.

The property of the Blackmore Museum shall be deposited at Salisbury, and shall be vested in Trustees for the purposes of the Museum.

RULE III.

The Blackmore Museum shall be under the management of the Committee of the Salisbury and South Wilts Museum, subject to the consent of the Blackmore Museum Trustees, to be given at each Annual Meeting of the Members of the Salisbury and South Wilts Museum.

RULE IV.

The Trustees shall have power to close the Blackmore Museum for any special purpose, upon giving twenty-four hours' notice in writing to either of the Secretaries of the Salisbury and South Wilts Museum.

RULE V.

The Committee of the Salisbury and South Wilts Museum shall not be held responsible for any claims or charges in respect of the Blackmore Museum.

RULE VI.

It shall not be competent for the Trustees to make any dividend, gift, division, or bonus in money or otherwise unto or between any of the members of the Blackmore Museum.

RULE VII.

Honorary Curators shall be appointed by the Trustees, and the arrangement of specimens shall be left in their hands.

RULE VIII.

The Trustees shall have power to remove any objects from the Blackmore Museum, for exhibition or scientific examination, at their discretion.

RULE IX.

An Honorary Secretary (who shall also act as Librarian) shall be appointed by the Trustees, and all books, drawings, manuscripts, and communications shall be under his charge.

RULE X.

No alteration shall be made in the Rules of the Blackmore Museum except with the unanimous consent of the Trustees, and no such alteration shall be binding upon the Committee of the Salisbury and South Wilts Museum except after a month's notice given to either of the Secretaries of the same.

RULE XI.

The Blackmore Museum shall be open to the public free of charge from 10 A.M. until 4 P.M., at least three days in each week, such days to be appointed by the Committee of the Salisbury and South Wilts Museum.*

RULE XII.

The attendants are strictly prohibited from accepting any gratuity from visitors to the Museum.

(Signed)

WILLIAM BLACKMORE,	} Trustees of the Blackmore Museum.
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We approve, accept, and adopt the above Rules for the government of the Blackmore extension of the Salisbury and South Wilts Museum.

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* The Blackmore Museum may be seen daily, Sundays and Saturdays excepted.

GENERAL ARRANGEMENT.

THE Collection in the Blackmore Museum is arranged in four Groups:—

GROUP I.

Remains of Animals found associated with the works of Man.

GROUP II.

Implements of Stone.

GROUP III.

Implements of Bronze.

GROUP IV.

Implements, weapons, and ornaments of Modern Savages, which serve to throw light upon the use of similar objects belonging to pre-historic times.

Drift Series.

SHELLS.

A 1.

This Case contains specimens of land, fresh-water, and marine shells, from the base of the loëss at Menchecourt, in the valley of the Somme, France.

LAND SHELLS FROM THE PLEISTOCENE FLUVIO-MARINE SAND (SABLE AIGRE) OF MENCHECOURT, NEAR ABBEVILLE, CONSISTING OF

- | | |
|------------------------------|------------------------------|
| 1. <i>Limax agrestis</i> | 5. <i>Helix</i> |
| 2. <i>Helix arbustorum</i> | 6. „ <i>pulchella</i> |
| 3. <i>Vitrina pellucida</i> | 7. „ <i>pygmæa</i> |
| 4. <i>Pupa muscorum</i> juv? | 8. <i>Cyclostoma elegans</i> |

FRESH-WATER SHELLS FROM THE SABLE AIGRE OF MENCHECOURT.

- | | |
|---------------------------------|--------------------------------|
| 9. <i>Lymnæa limosa</i> | 16. <i>Bithynia ventricosa</i> |
| 10. „ <i>palustris</i> | 17. <i>Valvata piscinalis</i> |
| 11. <i>Velletia lacustris</i> | 18. „ <i>cristata</i> |
| 12. <i>Planorbis carinatus</i> | 19. <i>Cyclas rivicola</i> (?) |
| 13. „ <i>spirobis</i> | 20. „ <i>cornea</i> |
| 14. „ <i>vortex</i> | 21. <i>Pisidium pulchellum</i> |
| 15. <i>Bithynia tentaculata</i> | |

MARINE SHELLS FROM THE SABLE AIGRE OF MENCHECOURT.

- | | |
|-----------------------------|-------------------------------|
| 22. <i>Buccinum undatum</i> | 25. <i>Tellina solidula</i> |
| 23. <i>Litorina rudis</i> | 26. <i>Hydrobia marginata</i> |
| 24. <i>Litorina</i> | |

The following land and fresh-water shells are exhibited from the loëss of Fisherton Anger, near Salisbury.

FRESH-WATER SHELLS.

- Ancylus fluviatilis*
Lymnæa palustris
 „ *limosa*
Planorbis spirobis
 „ *carinatus*
Bithynia tentaculata
Valvata piscinalis
Pisidium fontinale
 „ *pulchellum* var. (Jenyns)
 „ *pusillum*
 „ *obtusale*

LAND SHELLS.

- Succinea putris*
 „ *elegans*
 „ *oblonga* *
Helix arbustorum
 „ *nemoralis*
 „ *pygmæa*
 „ *pulchella*
 „ *hispidia*
 „ „ var. *concinna*
 „ *rotundata*
 „ *fulva*
Pupa muscorum
Zua subcylindrica

* This is the only shell not found at present in this neighbourhood.

MAMMALIAN REMAINS.

THE mammalian bones exhibited in Cases A 3, B 1 to 5, C 1, and 3, and E 1, are, with few exceptions, from the brick-fields at Fisherton, about a mile to the west of Salisbury. The clay from which they were obtained belongs to that division of the tertiary formations known as the *Mammalian drift* or *Pleistocene*.

A 2.

Contains a series of lower molar teeth of cave lion (*Felis spelæa*), from the brick-earth of Menchecourt, in the valley of the Somme, France.

Portions of the lower tusks of hippopotamus (*Hippopotamus major*), from the drift of Sussex and Bedford.

Upper and lower molar teeth of *Rhinoceros tichorhinus*, from Sherborne (Dorset); Bath; Erith (Kent); and Bedford.

One lower and part of upper molar of *Elephas meridionalis*, from Dewlish, Dorset.

Lower molar teeth of *Elephas antiquus*, from the forest bed at Cromer, Bedford.

Also upper and lower molar teeth and portions of tusks of Mammoth (*Elephas primigenius*), from Bedford; Ashford, near Fordingbridge; Wishford, near Salisbury; Cambridge; and the "Elephant bed" of the late Dr. Mantell, on the coast, near Brighton.

A 3.

All the fossils in this Case are from Fisherton Anger, near Salisbury, and consist of—

Two lower molar teeth of wolf (*Canis lupus*).

Portion of humerus and lower jaw containing teeth of fox (*Canis vulpes*).

A perfect series of upper molar teeth of reindeer (*Cervus tarandus*), belonging to an old animal.

Both upper and lower molar teeth of *Rhinoceros tichorhinus*, showing different stages of wear.

Molar teeth of mammoth (*Elephas primigenius*), including three examples of the old worn-down or used-out molars, also a fine lower molar from the lower level gravel of South Burcombe, near Fisherton. The fragment of tusk illustrates its formation of hollow cones, one fitting within the other. This arrangement is produced by the hardening of the cement-forming capsule.

Skulls and bones of the Fisherton spermophile; some examples show the curled-up position assumed by the creature in its long winter sleep.

Portions of clay containing remains of several individuals of lemming (*Lemmus*, *sp.* ?).

Tablet containing imperfect upper and lower jaws, teeth and bones of ringed lemming (*Lemmus torquatus*).

Fragment of left femur of hare (*Lepus timidus*).

B 1.

All the remains in this Case are from Fisherton. Metacarpal and metatarsal bones of bison (*B. priscus*), also of a small variety (*B. minor* ?).

1st and 2nd vertebræ of bison. The second or axis shows necrosis of the body.

Series of upper molar teeth of young animal, remarkable for possessing a well-developed accessory column on the outer side of the true molars.

Portions of a large horn core and skull of urus (*Bos primigenius*); also small stout metacarpal bones, probably belonging to a small variety of the same animal.

B 2.

Contains metacarpal and metatarsal bones of urus (*Bos primigenius*) from Erith, Kent; Banwell (bone cave), Somerset; and Fisherton; also various other bones of bos and bison, from Fisherton.

B 3.

All the remains in this Case are from Fisherton.

They consist of portion of lower jaw of cave lion (*Felis spelæa*) with the last molar *in situ*.

Nearly half lower jaw of cave hyæna (*Hyæna spelæa*), containing one incisor, the canine, and three molar teeth.

Base of shed antler of red deer (*Cervus elaphus*), of large size, and other smaller fragments of antlers.

Horn core of bison (*Bison minor* ?)

Left nasal bone and portion of tibia and astragalus of musk sheep (*Ovibos moschatus*).

Fragments of bones and antlers showing marks of gnawing, probably by young hyænas or wolves.

Detached teeth and bones of urus and bison.

B 4 AND E 1.

Contain shed antlers of two varieties of reindeer (*Cervus tarandus*), as well as bones and teeth—all from Fisherton.

B 5.

Teeth and bones of horse (*Equus fossilis* and *E. caballus*), all from Fisherton. These remains indicate horses of different sizes.

B 6.

Contains fragments of bones of mammoth (*Elephas primigenius*), rhinoceros (*R. tichorhinus*), and horse (*Equus fossilis*), all from Fisherton.

C 1.

Contains metacarpal and metatarsal bones of urus (*Bos primigenius*) and bison (*Bison priscus*), from Fisherton.

C 2.

Contains humerus of horse (*Equus fossilis*), from the drift gravel at Amiens, in the valley of the Somme, France.

Distal extremity of tibia of red deer (*Cervus elaphus*), from Menchecourt, France.

Teeth and bones of urus (*Bos primigenius*), from Erith, Kent ; and Bedford.

C 3.

Contains teeth, bones, and portions of antler of reindeer (*Cervus tarandus*), from Fisherton. These remains belonged chiefly to young animals.

Rolled or waterworn bones are exhibited ; this condition is exceptional at Fisherton.

Cave Series.

MAMMALIAN REMAINS.

B 7.

Lower jaws and teeth of cave bear (*Ursus spelæus*) from the bone caves of the Pyrenees (L'herm and Bouichêta, Ariège).

B 8.

Contains teeth of hyæna (*Hyæna spelæa*), wolf (*Canis lupus*), portion of lower jaw of fox (*Canis vulpes*), rhinoceros (*Rhinoceros tichorhinus*), horse (*Equus fossilis*), urus (*Bos primigenius*), from Aurignac (Haute Garonne,) France.

Portion of lower jaw of ox, from Massat (Ariège), France.

Fragment of lower jaw of reindeer (*Cervus tarandus*), from La Vache (Ariège).

Teeth of ox and bones of reindeer (*C. tarandus*), from Laugerie (Dordogne), France.

Bones of ox and reindeer (*C. tarandus*), from La Madelaine (Dordogne), France.

Bones of reindeer (*C. tarandus*) and horse (*Equus fossilis*), from Les Eyzies (Dordogne), France.

B 9.

Contains remains of reindeer (*C. tarandus*), consisting of portions of antlers, upper and lower molar teeth, and fragments of various bones.

Teeth and bones of large species of ox.

Portion of lower jaw containing teeth, detached upper molars and bones of horse (*Equus caballus*) from Les Eyzies (Dordogne), France.

Also bones of spotted hyena (*Hyæna crocuta*); fox (*Canis vulpes*); ox (large animal); fallow deer (*Cervus dama*; var. *barbarus*); red deer (*Cervus elaphus*); goat (*Capra hircus* ?); ibex (*Capra ægoceros*); pig (*Sus scrofa*); and black rat (*Mus rattus*). Skulls and bones of rabbit (*Lepus cuniculus*). Many bones of different species of birds. Portions of human skulls and bones found associated with the above remains in the Genista Caves, Gibraltar; presented by Colonel Henry Hope Crealock, and Captain Brome.

CASES 4 AND 5.

Contain bones and teeth of ox (*Bos taurus*).

Sheep (*Ovis sp. ?*), variety with slightly curved and laterally compressed horns, in some respects resembling the small Dartmoor and Welsh sheep.

Goat (*Capra hircus*), and pig (*Sus scrofa*) from the caves of Bédeilhac, Niaux, and Alliat (Ariège), Pyrenees.

All these remains belong to the neolithic period.

CASES A 4, 5, 6, AND C 6.

Contain animal remains from the turbaries of Cambridgeshire, Bedfordshire, Berkshire, and Wiltshire, comprising a nearly entire skeleton of red deer (*Cervus elaphus*); antlers of roe deer (*Cervus capreolus*); urus (*Bos primigenius*); long-fronted ox (*Bos longifrons*); sheep (*Ovis sp. ?*); wild boar (*Sus scrofa*); and horse (*Equus caballus*).

H 1.

On the top of this Case is exhibited the skull of urus (*Bos primigenius*) from Burwell Fen, Cambridgeshire.

H 2.

On the top of this Case are mounted several very fine antlers of red deer (*Cervus elaphus*) from Oxford; and Swaffham Priory, Cambridgeshire.

H. P. BLACKMORE, M.D.

Stone Age Collection.

SIR JOHN LUBBOCK has suggested the terms *Palæolithic* and *Neolithic* for the two main divisions of the Stone Age.

Palæolithic Period.

Implements of the Palæolithic period are formed by the process of chipping only; no single instance of finishing them by artificial rubbing has been observed. They are also usually found associated with remains of the mammoth, the woolly-rhinoceros, the musk-ox, the reindeer, and other animals, many of which are of extinct species, whilst the entire fauna presents more of an arctic character than that of the present day.

Flint implements have been repeatedly found *in situ* in undisturbed beds of sand, loam, and gravel, deposited chiefly in valleys of certain rivers in England and France, and which deposits belong to the post-pliocene or Quaternary period of geologists. It follows, therefore, that the age of the implements cannot be less, whilst it may be greater, than that of the beds themselves.

Our knowledge of the Palæolithic period has been greatly extended by the discoveries made in certain bone-caves in England, France, and other countries, in which the remains of a fauna, closely resembling that obtained from the valley-gravels, have been discovered. Many of the bone implements from these caves exhibit artificial rubbing, yet in no instance have the flint implements been similarly finished.

Neolithic Period.

During the Neolithic period some of the flint and stone implements, such as *hatchets* and *axes*, after having been chipped into shape, were finished by artificial rubbing or polishing; many others, such as *arrow-heads* and *scrapers*, were still formed by the processes of flaking and chipping only.

No implements of characteristic Neolithic types have been found under circumstances enabling them to be assigned to the Palæolithic period; but the reverse cannot be asserted, although cases are rare; remains of the extinct mammalia (Mammoth, &c.) have not been found with objects of the Neolithic period.

PALÆOLITHIC PERIOD.

DRIFT SERIES.

Attention was called to the human-worked flints obtained from the drift of the Somme Valley, by the late M. Boucher de Perthes, about 1840.

In April, 1857, Mr. Prestwich, F.R.S., and Mr. John Evans, F.S.A., inspected the Abbeville beds, under the guidance of M. Boucher de Perthes; and, at Amiens, Mr. Prestwich and Mr. Evans saw one of the pear-shaped flint implements *in situ*. In the same year Mr. J. W. Flower, F.G.S., found a pear-shaped flint implement *in situ* at Amiens; shortly afterwards Mr. James Wyatt, F.G.S., and Mr. T. Rupert Jones, F.G.S., were equally fortunate.

Singularly enough, a flint implement appears to have been found in the drift of Salisbury in 1846, although the circumstance has only recently been brought to light. Signor Ceselli also found flint flakes in the drift at Ponte-Mammolo, near Rome, associated with remains of elephant, rhinoceros, &c., so long ago as 1846; almost simultaneously, in fact, with the discoveries in the Somme Valley and at Salisbury.

The specimens exhibited from the drift in the Blackmore Museum are classed as follows:—

1. Flint flakes—some of which show subsequent chipping at the edges.
2. Scrapers—flint flakes of a more or less semi-lunar form, left broad at the straight side, and with the curved edge blunted by a series of purposely administered blows, in order to give a scraping rather than a cutting edge to the implement. Other scrapers, approaching the neolithic forms, have also been found in the drift.
3. Pointed or pear-shaped implements—having, in typical specimens, a rounded butt, a sharp edge at the sides, and a pointed end.
4. Shoe-shaped implements—in typical specimens perfectly flat on the under side, and on the upper side rising towards the centre in the form of a shoe, the thick end (heel) almost unworked, the sides and the rounded point (toe) brought to a sharp edge. These implements may have been used as adzes, the flat side resting upon a corresponding flat portion of the wooden handle, as with some stone tools in recent use among savages.
5. Discoïdal implements—very coarsely worked; in typical

specimens nearly circular, very thick in the centre, and brought to an edge all round; they differ in form and in workmanship from the oval implements. They may have been used as missiles.

6. Oval implements—having a sharp edge all round, and in section thickening towards the middle.
7. Heart-shaped implements—in typical examples having a sharp edge all round, but in some cases presenting in section a thickening towards the broad end rather than towards the middle. If any of the drift implements were employed as spear-heads, it is probable that these heart-shaped implements were so used.

A 7, 8, B 10, AND D 10.

The flint implements in these Cases are from the valley-gravels (drift) of France, chiefly from St. Acheul and Abbeville, in the valley of the Somme, and from Vaudricourt (Pas-de-Calais).

A 7.

Nos. 8 and 9 are simple flakes, showing the bulb of percussion upon the under surface. The remainder of the specimens are implements of the *pear-shaped* class, having a bulbous termination at one end, and a point at the other. No. 1 may be instanced as a rude example of this type, and No. 6 as a well-finished specimen of it. No. 12 may have been used as a boring-tool.

A 8.

The specimens in this case are of the *oval* class, having a sharp edge all round; this type, however, passes into the *pear-shaped* type by intermediate forms, so that no sharp line separates the two. No. 6 is a typical oval. Nos. 12, 13, and 14 are of the *shoe-shaped* type. No. 13 is a typical example. Nos. 15 and 23 are of the *heart-shaped* type. No. 4, when made, must have been black over its entire surface; some slight idea of the time which has elapsed since it was chipped into form can be derived from observing the thickness of the white crust, the formation of which is due entirely to age.

D 10

Contains the other specimens exhibited from the drift of France. Nos. 10, 11, 12, 13, and 14 are from Poitou; they are of drift type, although found upon the surface soil.

B 10.

In this Case, Nos. 10 and 11 are *scrapers*—implements with a broad back and a blunt edge, closely resembling tools in recent use by the Esquimaux for removing fat, &c., in preparing skins.

or clothing and the like. Modern examples of these tools may be seen in Case D 5, Nos. 14, 15, 16, and 17.

A 9 TO A 18, B 10, D 8, AND D 9.

FLINT IMPLEMENTS FROM THE DRIFT OF ENGLAND.

A 9.

Implements from the river-gravels of the valley of the Lark, at Warren Hill, Mildenhall, and Bury St. Edmunds. No. 13 is a well-finished implement. Nos. 7, 8, and 17 are of the discoïdal class, resembling many belonging to the neolithic (later stone) period. No. 18 is one of these for comparison. Attention is directed to Case A 51, in which implements of a similar form are exhibited (Nos. 1 to 8), which were found in a tumulus in Ohio, U.S.A.

The discovery of flint implements in the drift at Bury St. Edmunds was made by Mr. H. Prigg, jun., of that place, who obtained the first in October, 1862. Mr. Prigg, also, has by his investigations led to the discovery of flint implements in the drift at Thetford, and elsewhere.

A 10, A 12, AND D 8.

IMPLEMENTS FROM THE DRIFT OF THE VALLEY OF THE LARK, AT ICKLINGHAM, SUFFOLK.

A 10

Contains implements of rude workmanship, some being little more than flakes. Mr. John Evans, F.S.A., drew attention to the existence of flint implements in the drift gravel at Icklingham in 1859.

A 11.

In this Case some good specimens are shown. No. 5 may be noticed. No. 6 is one of the choicest specimens yet obtained from the drift of England; it belongs to the *heart-shaped* class; the patina which covers the entire surface is remarkable. No. 11 is a good example of the *shoe-shaped* class.

A 12.

The implements in this Case are of the *oval* class, of which No. 5 is a good typical example.

A 13, A 14, AND D 8.

IMPLEMENTS FROM THE DRIFT OF THE VALLEY OF THE LITTLE OUSE, AT AND NEAR THETFORD, NORFOLK.

These as a *group* are of a more *pear-shaped* form than those from Icklingham, which as a *group* approach the *oval* type.

A 13.

Nos. 1 to 4 are from Broomhill, near Brandon; Nos. 5 and 6

from Santon Downham, near Brandon; the rest are rudely-formed implements from Thetford. No. 6 has been presented to the collection by Mr. James Wyatt, F.G.S.

A 14.

All the specimens in this Case are from Thetford. Nos. 1, 2, 3, 7, and 9 are good examples of *pear-shaped* implements. No. 20, from White Hill, Thetford, is a remarkable specimen. Mr. Flower, F.G.S., has discovered several new localities in the drift of the valley of the Little Ouse, from which he has obtained flint implements.

A 15.

Nos. 1, 2, 3, and 4 are implements from the valley of the Ouse, at Biddenham, near Bedford; they are all good typical examples from this deposit. No. 3 is particularly fine in its workmanship; it is also well patinated.

These specimens have been most kindly presented to the collection by Mr. James Wyatt, F.G.S., of Bedford. The patient researches of Mr. Wyatt in the valley-gravels near Bedford resulted in his obtaining from them two flint implements on the 8th April, 1861; since which time he has added about thirty-five other specimens to his collection from this locality.

Nos. 5 to 17 are implements from the drift which caps the cliffs on the coast at Hill Head, near Fareham, Hants; No. 11 was obtained from a mass which had fallen from the cliff; all the rest were found upon the beach, as will be seen from their water-worn condition. In No. 7 the rounded butt of the flint has been left unworked; probably this implement was used in the hand, like the modern hand-adze from New Guinea, in Case E 2, No. 7. No. 13 is a very fine specimen of the *oval* class.

The discovery of flint implements at Hill Head was made by Mr. James Brown, of Salisbury, on the 31st of May, 1863. All the specimens exhibited from this locality were found by Mr. Brown and his friends.

A 16, 17, 18, B 10, AND D 9.

IMPLEMENTS FROM THE DRIFT OF THE NEIGHBOURHOOD OF SALISBURY.

A 16

Contains specimens from the drift-gravel at Elm Grove, Milford Hill, Salisbury. No. 19 is a *scraper*. Nos. 14 and 15 are *borers*. No. 2 is a poor example of the *shoe-shaped* class.

A 17.

These implements are also from Elm Grove. Nos. 7 and 9 are remarkable specimens; they are flat on the under side, as also is

No. 6. No. 9 is of chert, derived from the upper green-sand, a very tough material, seldom used for implements. No. 14 is a fine example of the oval class.

The first implement from the gravel at Milford Hill was found by Dr. Blackmore on April 27, 1864.

A flint implement, however, was obtained from the drift of Salisbury about twenty years since; it is labelled 'Salisbury, 1846;' but no exact record of the circumstances under which it was discovered has been preserved. It was given to the late Dr. Woodward, of the British Museum, who put it aside, as it had little reference to his own special studies. This specimen is now in the collection of Mr. Prestwich, F.G.S.; it was lent by him to Mr. Cunningham, F.G.S., who exhibited it at the Salisbury meeting of the Wiltshire Archæological and Natural History Society, September, 1865. It does not, either in type or condition, resemble the implements since found in the neighbourhood of Salisbury.

A 18.

Nos. 1 to 14, and No. 25, are from the gravel capping the hill which divides the Avon and the Wiley valleys, above Bemerton, between Salisbury and Wilton. No. 3 is a remarkably small implement. No. 25 is a *scraper* of the type more abundant during the Neolithic than the Palæolithic period. In Case B 10, No. 27 is another example of this type from Britford, near Salisbury.

The discovery of flint implements in the gravel at Bemerton was made by Dr. Blackmore, September 14, 1863.

Nos. 15 and 16 are from the brick-earth (*loëss*) at Fisherton Anger, near Salisbury; No. 16 is a good example of the *heart-shaped* type; it was found beneath remains of the mammoth, July 8, 1864. No. 17 is from the drift at South Newton, about five miles above Salisbury, in the Wiley valley; it is the only specimen hitherto obtained from this locality, and was found in May, 1868, by Mr. James Sidford, who has presented it to the collection. No. 18 is from the drift at Lake, about six miles above Salisbury, in the Avon valley. The discovery of implements at Lake was made by Mr. Tiffin, jun., of Salisbury, Oct. 13th, 1865. Nos. 19, 20, 21, and 22 are from the drift-gravel at Ashford (the new railway station), near Fordingbridge, Hants. Implements were first obtained from this locality by Mr. Toomer, of Salisbury, April 10th, 1866; these and some other specimens subsequently found by him have been presented to the collection.

Nos. 23 and 24 are from the drift capping the cliff at Bournemouth. The first implement from Bournemouth was found by Mr. Alfred H. Stevens, of Salisbury, in May, 1866.

D 8.

In this Case the less perfect specimens from Bury St. Edmunds, Icklingham, and Thetford, are exhibited.

D 9.

In this Case, the less perfect specimens from Milford Hill, Bemerton, Hill Head, and Bournemouth are exhibited.

D 10.

In this Case, in addition to the implements from the drift of France already alluded to, there is a series of implements made of quartzite from the laterite deposits of the Madras Presidency, East Indies—Nos. 1 to 8. They are of the same types as the implements from the drift of England and France, and were found by Mr. R. Bruce Foote, F.G.S., of the Geological Survey of India, who has presented them to the collection.

These quartzite implements occur scattered irregularly upon the surface of rising grounds, and even upon open plains, in some cases as much as 2000 feet above the present level of the sea. They have, however, been more frequently obtained from the beds of the little lateral valleys of the streams, and appear in such cases to have been washed out of the beds of gravel and shingle exposed on the banks of these valleys. They have been found *in situ*, at depths ranging from four to seven feet, in a bed of pale yellow and greyish coarse clay, more or less mixed with sand, fine gravel, and shingle, which sometimes attains a thickness of twenty feet.

In a paper read by Mr. Bruce Foote at Norwich, in August, 1868, he pointed out that all the types of flint implements present in the drift of England and France occur in the laterite deposits of Madras. He stated that the discoidal specimens from the East Indies were more finely worked than any he had seen from the drift of Western Europe. Oval and ovoid forms of implements occur abundantly in the laterite beds; many of these, however, have a square chisel-like cutting edge at one end: this type is rare in drift deposits. No. 9 is the cast of an implement from the drift of Spain; it is an example of the type named, and closely resembles the specimen (No. 1) immediately beneath it, from the gorge of the Naggery River. The discovery of the original of No. 9 in the quaternary beds of San-Isidro, near Madrid, was announced to the Geological Society

of France by MM. de Verneuil and L. Lartet, on the 22nd June, 1163.

B 10.

In this Case examples of *scrapers* are shown. Nos. 1 to 11. Nos. 12 to 16 are specimens of the so-called "fossil beads."

No. 27 is a scraper of the form least frequently found in the drift. Nos. 17 to 26, and 28 to 34, are chiefly waste flakes, struck off during the manufacture of implements. Nos. 28 and 33 show much subsequent work.

D 3.

In this Case forgeries of implements of drift type are exhibited,—Nos. 1 to 32. Nos. 1 to 3, 6 to 8, 10, 14, 21 to 24, 28, and 30 are the productions of French artists. Nos. 6 to 8 are from Abbeville: an attempt has been made to give false patina to these specimens. Nos. 2 and 11 were bought in Paris. The rest of the French forgeries were chiefly obtained at St. Acheul. The productions of "Flint Jack" are Nos. 9, 17, 18, 25 to 27, 29, 31, and 32. These he made in Salisbury *to order*. Nos. 15 and 16 are drift flints which have been *improved* by the finders. The remaining forgeries are the work of amateurs connected with the Museum. (See Nos. 5 and 13.)

Nos. 33 to 56 are exhibited as natural forms of flint; these in no case show human workmanship, but from their form are calculated to mislead inexperienced collectors.

CAVE SERIES.

B 11 TO B 16, C 10 TO C 12.

The specimens in these Cases have been obtained chiefly from the caves of France. No artificial rubbing occurs upon any of the flint implements. Remains of a fauna, nearly identical with that of the drift, abound in these caves, intermingled with vestiges of human industry, but no trace of any domesticated animal has been observed.

Nearly all the objects exhibited were found in caves, and under rock-shelters, on the banks of the Vézère, Dordogne, by the late Mr. Henry Christy, and his friend M. E. Lartet, of Paris; the whole of the expenses attending these investigations were borne by Mr. Christy.

The different stations have been classed according to their supposed relative antiquity.

B 11.

1. *Le Moustier*.—This is a cave at an elevation of 90 feet above the river Vézère, Dordogne, France. Remains of

the mammoth and the hyena have been found in it. The flint implements are of very drift-like types. The large *scrapers*, such as Nos. 6 to 10, closely resemble those exhibited from the drift (Case B 10, Nos. 1 to 11), and also the examples in recent use by the Esquimaux (Case D 5, Nos. 14 to 17). Stone skin-scrapers of a similar form are in present use by the Merrimack Indians. Nos. 13 to 18 are flint spear-heads; No. 19a is similar to the *discoïdal* type of implement found in the drift (see Case 8, Nos. 7, 8, and 17); No. 25 is the cast of a hammer-stone showing bruising from use. For comparison, see Case A 19, Nos. 4 and 7; A 20, Nos. 1, 2, 3; A 21, Nos. 13 and 20; all of which belong to the later Stone period (neolithic). Not a single worked bone or sculptured animal figure has been found at Le Moustier.

B 12 TO B 15, C 10 TO C 12.

2. *Gorge d'Enfer*.—A rock-shelter in the Gorge d'Enfer (a small valley off the Vézère) has produced worked bone implements, among which may be noticed arrow-heads of a peculiar type, and flint implements, principally long flakes and scrapers, which last are shown on tablets 3 and 4. See also cast of bone implement C 10, tablet 1.

To the same period belong the objects from the cave of Aurignac (Haute Garonne), Case B 11, tablets 1 and 2; and from the cave of Rebinac (Basses-Pyrénées), Case B 11, tablet 3.

3. *Les Eyzies, La Madelaine, &c.*.—The cave of Les Eyzies is situated at 114 feet above the level of the Vézère. After having served as a habitation for the early occupants, who left on the floor their rubbish, such as bones, broken implements, &c., an infiltration of water, containing calcareous matter, took place, which formed a cake, or breccia, on the surface of the floor of the cave, and secured the objects beneath from being disturbed. Specimens of this breccia, containing broken animal bones and human-worked flints, are shown upon the top of Case H 5, Nos. 1 and 2, and in Case C 10, Nos. 3, 7, and 8. No. 7 contains a *scraper* of flint still embedded in the matrix.

The objects discovered in Les Eyzies are flint-flakes, Case B 13, tablets 17 to 21, and 26 to 32; flint-scrapers, Case B 13, tablets 9 to 16, and 23 and 24; nuclei, or cores, from which flakes have been struck off, Case B 13, tablet 25; hammer stones and mortars; the bones of horse, reindeer, ox, &c., some of them worked, Case B 13, tablets 2 and 6; a few engravings

on bone and stone, see cast, Case B 13, tablets 4 and 5; bone needles; barbed spear or harpoon heads, &c., Case B 13, tablets 1 and 3; and portions of hæmatite which have probably served for paint, Case B 13, tablet 8.

From the rock-shelter at La Madelaine the following objects have been obtained in greater abundance than at Les Eyzies:—worked bones, Case B 15, tablets 21 and 22, C 12, tablet 11; harpoon heads, Case B 15, tablets 1 to 8, C 12, tablets 1 and 2, some of which are casts; sculptured bones, Case B 15, tablets 9 to 16 and 23 and 24, Case C 12, tablets 3 to 9, some of which are casts; Case C 12, tablet 10, is the cast of a portion of a mammoth's tusk, upon which is engraved the outline of that animal; a stone mortar is exhibited in Case C 10, No. 9. The animal remains at La Madelaine present no difference as to species from those found at Les Eyzies. The objects found in the cave at Massat (Ariège), Case B 11, tablets 4 and 5, are classed with those from Les Eyzies and La Madelaine.

4. *Laugerie Haute*.—This station on the right bank of the Vézère is a rock-shelter, and has produced various remains, including a number of delicately chipped flint lance-heads, some of them closely resembling in type the flint spear-heads of Denmark and England, Case B 12, tablet 7; drills of flint, Case B 12, tablet 8. Arrow-heads and harpoon heads of bone are rare at this station, although at Laugerie Basse, near by, they are abundant, Case B 12, tablets 11 and 12, Case C 11, tablet 3. Casts of sculptured bone from Laugerie Basse are exhibited, Case B 12, tablets 9 and 10, C 10, tablets 5 and 6, C 11, tablets 1, 2, 4, and 5; and bone needles with drilled eyes, Case B 12 tablet 13.

B 14.

Upon tablets 1 to 17 are flint flakes and scrapers from the cave of Chaffaud (Vienne), France.

B 16

contains a series of worked bone objects, flint flakes, &c., from the cave of La Vache, Alliat (Ariège). Upon tablet 12 are some bone needles, with drilled eyes, from this cave.

SCRAPERS.

The large number of flint scrapers found in the caves of the Dordogne will have struck the observer. The broad flint scrapers from Le Moustier resemble those found in the drift; whilst the Greenland Esquimaux still employ a tool of very similar form. At the other stations in Dordogne, however, the flint scrapers are of a different type—see Case B 13, tablets 9 to 16; these

resemble scrapers of another shape which are still in use by the Esquimaux. In Case B 12, tablet 24, is the cast of such a modern scraper now in the Christy Collection, London; the original is of lydite, mounted in a handle of fossil ivory. In Case E 2, No. 2, is a modern Esquimaux scraper of flint in its original handle of wood, grooved to receive the two first fingers and the thumb of the right hand; the other two fingers were doubled underneath the handle of the implement, which was pushed forward by the palm of the hand, and had a planing action.

NEOLITHIC PERIOD.

ANCIENT PIT-DWELLINGS NEAR SALISBURY.

A 19, B 17, D 11, D 12, AND H 6.

IN these Cases are shown the objects chiefly obtained in 1866 from some interesting pit-dwellings explored by Mr. Adlam, at Highfield, near Salisbury; several specimens, however, were found in making the excavations for the Fisherton Waterworks in 1868. The pits are single, or in groups communicating with each other. They are of a beehive form, ranging in diameter at the base from 5 feet 6 inches to 7 feet, although in some exceptional cases they measure as much as 14 feet. The entrance to each pit, or to each group of pits, appears to have been by a shaft of about 3 feet in diameter.

The pits are carried to a depth of from 7 to 10 feet in the soil, which is a drift-gravel resting on chalk. The makers have studied the properties of the chalk, for they have enlarged their dome-like dwellings, when possible, beneath the looser gravel.

A 19.

OBJECTS FROM THE PIT-DWELLINGS AT HIGHFIELD.

Nos. 2, 3 and 4 are nodules of flint which have been used as hammers.

No. 5 is a discoïdal flint implement.

No. 11, 12, and 13 are flint implements.

It is probable that the Highfield pit-dwellings do not strictly belong to the Stone period.

H 6.

No. 1 is a grain-rubber, a mere hollowed stone. No. 2 is part of a saddle-shaped grain-rubber or quern, the material used being upper green sandstone.

The "saddle-quern" is a slab of stone, the upper surface of which is hollowed towards the middle, from use in grinding. The grain was probably parched, and then reduced to a coarse powder by a "runner" of stone worked by hand.

The next advance in the form of the hand-mill is when it consists of two circular discs of stone, the upper rotating upon the lower by means of a wooden handle inserted in the top stone. This form of quern was "fed" with grain through an aperture in the centre of the upper stone, the meal passing out between the margins of the stones. The upper stone was usually concave, and the lower convex, to prevent sliding off, and also to give a fall to the meal.—See H 6, No. 3, which is part of a quern of this kind from the Highfield pits.

The "pot-quern" is of more complex construction. It consists of a hollowed stone basin, with a smaller circular stone fitting into it. The smaller stone was made to revolve, and the meal escaped through a hole made at the side of the outer stone.—See H 7, No. 2, from Ireland.

Nos. 7 and 8 are fragments of querns from the Highfield pits. No. 9 is a rude pestle which has been used for bruising the grain.

Nos. 4, 5, and 6, are shed antlers of red-deer, portions of which have been sawed off, doubtless for the purpose of being converted into tools, or handles for tools.

B 17.

Tablets 1, 2, 3, 5, and 6 exhibit a series of pointed bone tools, some of which show signs of wear, as if they had been used for boring.—(See *a*, *b*, and *c*, tablet 1.)

Upon tablet 4 are three bone dart-heads. Similar objects, attached to the original shafts, in recent use by the Melanesians, are placed in Case E 4, Nos. 19, 20, 22, and 23, and in trophy H 13.

Bone tools are shown on tablet 7.

On tablet 8 is a hook made from the hinge of the jaw of *Bos longifrons*.

On tablet 9 are a bone ring, a portion of a bone needle with drilled eye, and other objects.

On tablets 10 and 11 are bone and horn (red-deer's antler) combs, the teeth of which have been broken off. These implements closely resemble some in recent use by the Esquimaux for scraping fat, &c., from the backs of skins. The Esquimaux tools are made of wood, with the sharp claws of birds lashed to them.

On tablet 12 are pieces of bone showing marks of cutting and sawing.

Flint arrow-heads are shown on tablet 13; a flint scraper on tablet 14.

On tablet 15 are some perforated clay balls which have probably served as fly-wheels in spinning.

On tablets 16, 17, and 18 are some pellets of baked clay. A similar object, in both form and material, was found in one of the subterranean chambers at La Tourelle, near Quimper, in Brittany, recently examined and described by M. R. F. Le Men.

These pellets were doubtless used for slinging; in form they closely resemble the leaden "glandes" (acorns) of the ancients.—See Case E 4, tablet 3 *a*, *b*.

The objects upon tablets Nos. 15 and 16 are made of plastic clay, probably obtained from Clarendon, about three miles distant from the pits. Some of this mottled clay in its unworked state was found in the pits; and large dome-shaped covers perforated with holes, which had apparently been used for ventilation, were also found in them, made from this material.

Upon tablets 20, 21, and 23 are pieces of worked bone.

Upon tablet 22, pieces of worked stag's-horn (red deer).

Upon tablet 24 is a bone showing marks of gnawing *c*, and two bones *a* and *b* fractured as if for the extraction of marrow.—See bones similarly fractured from Alliat, Case B 16, tablet 30.

D 11.

All the objects in this Case are from the Highfield pit-dwellings, except No. 1, which is a rude vessel of hand-made pottery found at Petersfinger, near Salisbury. The neighbourhood of Petersfinger abounds with flint flakes, rude tools of flint, and other vestiges of the Stone period. Many specimens from this locality are to be seen in the collection.

Nos. 5, 12, 13, and 14, as well as the entire contents of Case D 12, are specimens of pottery from the Highfield pits, and the trenches there, which latter probably may be referred to a rather later date than the pits. The whole of the pottery from the pits is hand-made; it has not been turned on the wheel. Attention is directed to the ornament upon No. 5, Case D 11, and to that upon the specimens shown on tablets Nos. 18 to 23, D 12; also to the red chevron-like ornament upon the specimen mounted on tablet 17 *a*, D 12.

In Case D 11, Nos. 6, 7, and 8 are oblong lumps of chalk drilled at one end; these have probably served as loom-weights for giving tension to the warp-threads in weaving.

Nos. 6 and 8 show wear at the sides of the drilled hole, apparently from the friction of a cord by which they have been suspended.

Bone tools from the Highfield pits are shown on tablets 17 and 18.

Upon tablets 19, 20, 21, 27, and 28 are pieces of stags' horn (red-deer) worked into handles for tools, or, as in 19, showing marks of rude sawing.

Upon tablet 22 is the shed antler of a roe-deer, which has been slightly worked.

Upon tablet 23 are two spatula-like implements made from rib bones.

Upon tablets 24, 25, and 26 are bones which have been highly polished towards the centre, as if they had been grasped at the ends, and then used for rubbing some (not hard) substance.

In the upper part of the Case are lumps of chalk which have been drilled or otherwise worked; also a number of worked flints.

D 13 AND D 14.

In these Cases the inferior specimens from various parts of England are exhibited.

A 19.

FLINT AND STONE IMPLEMENTS FOUND IN THE NEIGHBOURHOOD OF SALISBURY.

Nos. 7 and 8, found at South Newton, by Mr. J. Sidford, have been used as hammers.

No. 9, found at Bower Chalk, by Mr. G. Sidford, has been used as a hone.

Nos. 14 to 20 were probably used as hatchets. Some of these are unfinished. No. 18, found at Bishopston, by Mr. F. Sidford, is a very fine specimen.

Nos. 21 to 28, unlike the other specimens, have been brought to a smooth surface by artificial rubbing, after having been chipped into form. No. 27, from Tan Hill, near Devizes, presented to the collection by Mr. Coombs, is a good specimen. Nos. 22, 25, and 26, in this Case, and No. 24, A 20, appear to have been broken in use, and were then thrown away, probably because it was too much trouble to regrind the cutting edge.

A 20.

Nos. 1, 2, and 3 are hammer-stones.

No. 4 is a flint-pick.

Nos. 12 and 13, from Burwell Fen, Cambridgeshire, show the object which appears to have led to the use of artificial rubbing. In these specimens the rubbing has been merely for the purpose of removing sharp edges, and with the intention of rendering the implement more comfortable for use in the hand.

No. 15, from Flixton, near Manchester, is a fine specimen.

No. 22, found at North Sway, Hants, by Mr. Adlam, in November, 1868, and presented by him to the collection, is nicely polished.

No. 18 was found in the river Lambourn, Berks, in 1836; it has been presented to the collection by Mr. J. Ellis Jervoise.

A 21.

No. 1 is a flint hatchet of a type peculiar to the county of Norfolk.

No. 2 is part of a stone axe of large size; it was found at Howbeck, near Hesket, Newmarket, Cumberland.

No. 3 is a whetstone drilled for suspension, which has been much used; it was found by Mr. Aldridge at Longdon, Worcestershire, 19th Dec., 1868, and was presented by him to the collection.

C 13 AND C 14

contain flint cores, flint flakes, &c., from the neighbourhood of Salisbury.

B 18

contains worked flints from the neighbourhood of Salisbury.

Flint scrapers, tablets 5 *c*, *d*, 10 *b*, *d*, 18 *a*, 19 *c*; sling stones, tablets 4, 16, 28 *a*; flint drill, tablet 11, 20 *b*; flint wedges, tablet 21 *a*, 24; flint spear-heads, tablet 3 *b*, 12, 13; many of the flakes show wear, apparently from having been used to scrape some hard substance.—See specimens on tablets 1 *c*, and all on tablet 9. In Case C 41, No. 13, is a throwing-stick from Swan River, New South Wales, at the end of which is a knob of hard gum, placed there to prevent the implement from slipping from the hand. In this gum a piece of flint is imbedded, which exhibits marks of use, similar to those upon the specimens in Case B 18.

B 19.

Upon tablet 2 is a flint flake from South Newton, showing considerable wear at the edges.

Upon tablet 3 are two flint scrapers from South Newton.

Upon tablet 4 is a fragment of hand-made pottery, and a vitreous bead found with remains of an infant at Belmont, near Salisbury.

Upon tablet 5 is a piece of pottery, and part of a drilled bone pin found in a tumulus at Winterslow, near Salisbury, in 1867.

No. 6 *a* is a lozenge-shaped flint arrow-head, and *b* is a flint tool, both found at Catterly Clump, Wilts.

No. 7 *a* is an exquisitely-formed stemmed flint arrow-head, and *b* is a flat flint tool, both found at Pick Rudge Farm, Overton, Wilts, in grubbing up an ash tree on some waste land. These specimens formed part of Mr. Brackstone's collection; Mr. Brackstone obtained them from Mr. Wilkinson, of Bath, to whom they had been given by Mrs. Pamphrey, upon whose farm they were found.

Upon tablets 8 to 14 are flint scrapers and implements from the neighbourhood of Salisbury. Upon tablet 9 *b* is a fine javelin head of flint, from Whitsbury.

Upon tablets 15 to 21 are flint sling-stones, scrapers, and implements from Icklingham, Suffolk.

B 19.

Upon tablets 22 and 24 are scrapers, sling-stones, and worked flints from the neighbourhood of Weymouth.

Upon tablets 25 and 26 are a flint-flake and bone tools from Burwell Fen, Cambridgeshire.

Upon tablet 27 is an exquisitely chipped semi-lunar flint tool of rare type, found at Kempston, near Bedford, close to the spot where a flint spear-head of Scandinavian type had been found. It was found by Mr. James Wyatt, F.G.S., who has presented it to the collection.

It is probable that the above-named semi-lunar implement was used for dressing skins, a purpose to which those from Sweden and Denmark, Case 25, Nos. 2 and 8 to 14, may have been applied.

Upon tablet 28 is a stemmed arrow-head of flint, from Cumberland.

A 21, B 20 TO B 22, AND C 15.

FLINT WEAPONS, TOOLS, AND IMPLEMENTS, FROM THE YORKSHIRE WOLDS AND TUMULI.

A 21.

The specimens in this Case, Nos. 4 to 31, are from Bridlington, Yorkshire.

Nos. 4 to 13 are stone and flint balls and rude tools, many of which have been used as hammers. Nos. 4, 5, and 6 are good

examples. No. 14 is a seaside pebble which has been roughened artificially in the middle on both sides, to give a firmer hold to the operator, who probably held the implement between his thumb and first finger. The blows have been struck with the pointed ends, which are much bruised. For similar hammer-stones from Ireland, see Case A 26, Nos. 6, 7, and 8; from France, Case A 30, No. 28.

Nos. 18 to 28 are hatchets of flint and stone.

Nos. 30 and 31 are fragments of drilled stone axes.

C 15.

All the specimens in this Case are from Bridlington, Yorkshire.

Upon tablets 1 to 8 are flint flakes showing little work.

Upon tablets 10 to 15 are flint wedges, some of which are brought to a pointed end, others to a straight edge. Many of these show bruising at the broad end, probably from having been struck with a mallet when used. See tablets 12 *a* and 13 *b*.

B 20.

All the specimens in this Case are from Yorkshire; many of them were found by Mr. Charles Monkman, of Malton, by whom they have been presented to the collection.

Upon tablets 1 to 5 are worked flints, chiefly scrapers, from Ganton Wold.

Upon tablets 6 to 9 are similar objects from Langton Wold.

Upon tablets 10 to 12, similar from Heslerton Wold.

Upon tablets 13 and 14, others from Willerby Wold.

Upon tablet 15, others from Sherburn Wold.

Upon tablets 16 to 18, others from Amotherby tumuli.

Upon tablet 19, others from Scamridge.

Upon tablet 20, others from Pickering.

Upon tablets 21 to 24, others from Bridlington.

Flint saws are shown upon tablet 21.

A nicely-finished flint chisel is shown on tablet 24 *a*.

B 21.

All the specimens in this Case are from Yorkshire, and chiefly from Bridlington.

Flint scrapers are shown upon tablets 1 to 19. Among the many good specimens exhibited may be noticed tablet 14 *a*, tablet 16 *b*, and tablet 17 *a* and *b*.

Upon tablets 20 and 21 are some semi-lunar flints resembling the scrapers found at Le Moustier, Dordogne (see Case B 11,

Nos. 8 to 10). No. 20, however, is possibly merely a fragment of some larger implement.

Upon tablets 24, 25, 26, 27, and 28 are worked flints of undetermined use.

B 22.

All the specimens in this Case are from Yorkshire, and chiefly from Bridlington.

Upon tablets 1 to 5, 9, 10, and 15 are leaf-shaped flint arrow-heads.

Upon tablets 6, 7, and 8 are triangular flint arrow-heads. Some archæologists think that such specimens as *a*, tablet 8, were used for knives.

Upon tablets 15 and 16 are stemmed flint arrow-heads.

Upon tablets 11 to 14 are flint tools, many of which have been used for drilling, and show wear.—See tablet 12 *c*.

Upon tablets 18 to 20 are flint flakes, quite unworked upon the under side, but carefully chipped upon the upper surface.

Upon tablet 21 are flint spear-heads.

Upon tablets 25 to 28 are flint implements which only show traces of wear at the points, and which may have been used for flaking flint by *pressure*, in contradistinction to the process of flaking it by *percussion* in the ordinary way.

The specimens on tablet 8 exhibit such parallel flaking (ripple work) that it is difficult to believe it possible to remove flakes with sufficient precision by blows given with a hammer or other tool.

The modes of flaking, both by *pressure* and by *percussion*, are practised in modern, no less than they were in ancient times.

FLINT AND STONE HATCHETS, ARROW-HEADS, AND IMPLEMENTS
FROM IRELAND ARE EXHIBITED IN CASES A 22 TO A 27,
AND B 23 TO B 25.

B 23.

TRIANGULAR FLINT ARROW-HEADS.

Triangular flint and stone arrow-heads are shown on tablets 1 to 9. It will be observed that Sir William Wilde's *two* first classes of arrowheads are included in this series—the “triangular,” and the “triangular hollowed out at the base.”

Attention is directed to the fineness of the surface chipping upon many of these specimens—such as *e*, tablet 8; to the serration of edge, as in *i*, tablet 5; to the extreme correctness of outline, as in *g*, tablet 3; and to the great difficulty which

must have arisen in manipulating such small specimens as *d* and *f*, tablet 8.

Upon tablets 10 and 13 are shown flint-flakes which have been carefully chipped upon the upper surface, the under surface being unworked. Similar specimens are exhibited from Yorkshire, in Case B 22, tablets 18 to 20.

Flint spear-heads and implements are shown upon tablets 14 to 19.

Flint cores, or *nuclei* (blocks from which flakes have been removed) are shown on tablet 22. Flint tools which have been used for scraping are shown on tablet 23; *b* is much worn. A disc of flint *a* is shown on tablet 20. Similar flint discs from Yorkshire are shown in Case B 21, tablet 27, and an obsidian disc from Mexico, Case B 30, tablet 12 *d*; *b*, tablet 20, is a flint scraper.

B 24.

STEMMED FLINT ARROW-HEADS.

Stemmed flint and stone arrow-heads are shown on tablets 1 to 21. Sir William Wilde's "barbed" arrow-heads are included with his "stemmed" class in this series. The specimens *e*, tablet 16, and *d*, tablet 19, are much patinated; *f*, tablet 10; *e*, tablet 11; *a*, *b*, and *c*, tablet 13; and *e*, tablet 15, are serrated at the edges.

The arrow-head *c*, tablet 18, is indented on both sides, as if to afford greater security in fastening it to the shaft. For modern illustrations of the mode of attaching flint and obsidian arrow-heads to the shaft by the Pimo Indians, living on the banks of the Gila river in Arizona, about 130 miles from the Colorado river of California, see Case E 3, Nos. 16 to 24 and 43 to 50.

In Case E 3, Nos. 1 to 5 are examples of stemmed flint arrow-heads attached to the shaft in recent use by the Esquimaux of Behring's Straits.

B 25.

LEAF-SHAPED FLINT ARROW-HEADS.

Leaf and lozenge-shaped arrow-heads are shown on tablets 1 to 16; the surface chipping upon some of the specimens is remarkable, see *b* and *c*, tablet 1; *f*, tablet 2; all upon tablet 4; and *a* and *b*, tablet 5. Some of the specimens were artificially rubbed, after having been chipped, such as *a*, *b*, *d*, and *e*, tablet 7, and *a*, tablet 8. Upon tablet 19 is a flint spear-head.

In Cases B 23 to B 25 many flint flakes will be noticed

from different countries. These objects were probably seldom used unmounted. A flake of grey flint was, however, found in the bed of the river Bann, at Toome Bridge, between the counties of Antrim and Derry, which had one end wrapped round with moss (*Hypnum brevirostre*), intended apparently as a substitute for a handle. This unique specimen is in the collection of Lord Talbot de Malahide. It was shown in the Paris Exhibition (1867); M. Gabriel de Mortillet rather severely remarked that it was carefully enclosed in a glass bottle, and that it appeared to him to be unfitted for examination with the eye of a critic.

Flint flakes were doubtless often mounted as points to spears or arrows; flakes of obsidian are still used in New Caledonia and elsewhere for a similar purpose.—See specimens in Cases C 40 and E 3.

A 22.

STONE HATCHETS.

In Cases A 22 to A 24 stone hatchets from Ireland are exhibited. Such small specimens as Nos. 13 to 16 can only be regarded as chisels. No. 8 shows good workmanship. No. 20 has been used as a hone as well as a hatchet. No. 3, Case D 15, from Carnac, Brittany, has been applied to the same double purpose.

A 23.

Attention is directed to the bluntness of the edge of No. 8; in its present state it is perfectly useless as a cutting tool. Other examples of these blunt implements are in the collection; they do not appear to have become blunted in use, but some, at least, have been purposely rubbed down at the edge to *prevent* their cutting. See No. 1, Case 25, and No. 9, Case 26, both from Ireland, No. 1, Case 43, from Ohio, U.S.A., and more particularly No. 16, Case 45, from Missouri, U.S.A., which has been rubbed down purposely to a flat surface three-eighths of an inch wide at the broad end—the cutting part of ordinary stone hatchets. There is a remarkable bluntness at the edges of Nos. 6 and 8, Case A 32, and of Nos. 13 and 29, Case A 33, which cannot have arisen either from weathering or use.

Many of the stone hatchets exhibited were probably used unmounted. No. 4 in this Case, however, was evidently intended for hafting, as the space towards the middle has been left rough where it would have been bound to the handle; all other parts were rubbed to a smooth surface. See also a similar instance in Case A 30, No. 9, from Toulouse, France.

A 24.

The elegant form of Nos. 8 and 9 may be noticed.

A 25.

FLINT AND STONE HATCHETS AND TOOLS.

No. 2 appears to have been narrowed towards the middle, as if to render its attachment to the handle more secure; this specimen, like many others in the collection, has been used as an adze, rather than as a hatchet.

Many of the specimens in this Case are chisels. Nos. 23 and 24 are flint picks. No. 28 is an unusually fine polished flint hatchet from Ireland, in which country objects of this class, made of flint, are rare.

"Flint proper, or chalk-flint, as distinguished from oolitic chert, is only found in a very few localities in Ireland, chiefly in the counties of Antrim, Down, and Derry; hence we learn without surprise that the great bulk of the specimens of that material have been procured from the province of Ulster."

A 26.

STONE TOOLS AND IMPLEMENTS.

This Case contains a series of stone hammers, tools, and implements from Ireland. No. 1 is a stone for pounding corn. Nos. 3 to 18 are different varieties of hammer-stones, many of which show bruising from use. Nos. 17 and 18 were probably hafted by twisting a withe around them at the grooved part. Some country blacksmiths and platelayers on railways still haft their iron hammers in a similar manner.—See No. 34, Case C 42. Ancient examples of grooved stone axe-hammers from various parts of America are shown in Cases A 41, 42, 46, and 47, and No. 9, A 49.

The hammer-stones Nos. 4 to 11 were held between the first finger and the thumb, at the places indicated by the depressions. Such hammers as 6 and 8 were probably used for flaking flint, the blow being delivered from the small end of the stone, as is evident from the bruising at that part.—See No. 6. Hammers of this form are exhibited from Yorkshire, and from France. In Nos. 12 to 16 the depression for holding is deepened into a hole; such hammers, however, were probably still held in the hand, unmounted.

In some hammer-stones more than two depressions exist; thus in the Christy Collection there is a stone-pounder, or hammer-stone, from the Andaman Islands, with a series of depressions for the fingers and thumb. An ancient hatchet with

similar depressions was recently found in a subterranean chamber at La Tourelle, near Quimper, in Brittany.

No. 19 is a circular stone with a groove on both sides; this groove may have served for sharpening the point of a knife or dagger. Similar stones were in use at a comparatively late date. One was found at Nydam in Slesvig with objects belonging to the Iron period. It is figured by Engelhardt, and is classed as a whetstone.

Objects such as Nos. 32 to 42 in this Case, and Nos. 4 to 21 in Case A 27, are usually regarded as spindle whorls; probably some of them have been used to give increased momentum to spindles. For an ancient example from Peru, attached to the wooden spindle, see No. 10, Case A 52; and for modern examples from Africa(?) attached to the spindles, see Nos. 35 to 37, Case E 4.

No. 15, Case A 27, from its oval form, could not, however, have been applied to this purpose. Many so called spindle whorls have probably been used as buttons.

Many of the larger drilled stones, such as Nos. 14, 15, and 28, Case A 26, and Nos. 1, 2, and 3, Case A 27, have been called net-sinkers, and some may have been used for such a purpose.

A 27.

In addition to the drilled stones in this Case, which are similar to those in Case A 26, already described, some whetstones and polishing stones are exhibited. Nos. 24 and 25 are whetstones. No. 25 shows much wear. No. 33 is a whetstone now in use by jewellers; like No. 25 it is hollowed by the sharpening of tools. The whetstones exhibited probably belong to the metallic period.

Nos. 22 and 23 are polishing stones. The commencement of drilling on each of the four sides of No. 23 may be noticed; probably, when completed, it would have been worn on the person, as was doubtless the case with the objects Nos. 24 and 25.

Nos. 31 and 32 are regarded as hones by some archæologists; Sir William Wilde classes them as burnishers. American archæologists call them gorgets.

Specimens of sharpening and polishing stones are exhibited from Denmark, in Case A 38, Nos. 22 to 27. Nos. 23 to 25 belong to the early Iron period. No. 37 is a drilled axe-hammer from Ireland.

A 27.

SCOTLAND.

A small series of stone objects from Scotland is shown in this Case. No. 39 is a fine drilled axe-hammer.

Nos. 40 to 45 are "spindle whorls," of which probably not

many belong to the Stone period ; most of them appear to have been drilled with a metal tool having a hollow base, which would cut out a core, and not involve the extra labour of grinding away the entire substance of the stone. Nos. 7, 11, 13, 14, 18, and 21 in this Case, from Ireland, have probably been drilled in this manner, as well as No. 18, Case A 30, from France ; Nos. 12, 15, and others, in Case A 39, from Denmark : most of the drilling in the American series, Cases A 50 and A 51, and in the large series of stone smoking-pipes from the mounds of Ohio, Cases C 34 to C 39, was effected, probably, with tools of bronze.

Nos. 46, 47, and 48 are flint arrow-heads from Scotland.

D 15.

WALES.

No 37 is the cast of a sculptured drilled stone hammer ; the original, which is unique, was presented to the Society of Antiquaries of Scotland by the Rev. E. L. Barnwell. It was found about 1840, in stubbing up a wood at Maysmote, near Corwen, Merioneth.

STONE AND FLINT HATCHETS AND IMPLEMENTS FROM FRANCE
ARE EXHIBITED IN CASES A 28 TO A 30, AND D 15 TO 18.

A 28.

Nos. 2 and 20 are short flint hatchets, probably intended to be mounted in handles of stag's horn, or other material, in a similar way to the specimens from the Swiss lake-dwellings in Case A 31, and upon the top of Case H 8. Nos. 8 and 9 are nicely chipped flint implements ; No. 9 appears to have been intended for a gouge.

A 29.

Some very fine examples of flint hatchets are shown in this Case, such as Nos. 2 to 6 ; No. 2 exhibits a number of planes, caused by its having been rubbed on a flat surface.

No. 14 is an unusual form of hatchet from France ; it is almost Danish in type.

A 30.

The specimens in this Case are chiefly of greenstone, and are highly finished. No. 5 is a most elegant form of hatchet. Nos. 20 to 27 are classed as chisels. No. 28 is a portion of a hammer-stone. No. 9 is highly polished at both ends, but the intermediate part, around which the fastening to the handle was

placed, is purposely left rough. No. 18 is a drilled axe-hammer (probably drilled with a metal tool). No. 19 is a spear-head of flint, ten inches long, and finely chipped.

D 15.

The two lower shelves in this Case are filled with flint-flakes, implements, and stone hatchets, from France. Nos. 1 to 9, 19, and 20 are stone hatchets from Carnac, Brittany, and its neighbourhood, presented to the collection by the Rev. E. L. Barnwell. No. 12 is a flint scraper. Nos. 10, 11, and 13 are flint implements from the peat of the Somme at Abbeville. No. 21 is a net-sinker from the bed of the Seine.

CASTS OF OBJECTS FOUND IN SOME OF THE DOLMENS (OR CROMLECHS) OF FRANCE ARE EXHIBITED IN CASES D 16 AND D 17.

D 16.

Nos. 1 to 12 are casts of hatchets of fibrolite, greenstone, jade, and serpentine, found in the dolmen of Mont Saint-Michel, Carnac, Brittany; Nos. 10, 11, and 12 are drilled; the originals are in the Museum of the Société Polymathique du Morbihan, at Vannes.

The objects Nos. 13 to 27 are casts of specimens from the dolmen of Bougon (Deux Sèvres); found by M. Ch. Arnaud. Nos. 13 to 18 are casts of bone tools; Nos. 19 and 20, of teeth drilled for suspension; Nos. 21 and 22, of flint hatchets—No. 21 is stained green, apparently from having remained in contact with some object of copper or bronze; No. 23 is the cast of a drilled axe-hammer of greenstone; Nos. 25 to 27 are casts of flint flakes.

D 17.

Nos. 1 to 23 are casts of objects from the dolmen of Manné-er H'rock (*Montagne de la fée*), at Locmariaker (Morbihan).

Nos. 1 to 16 are casts of hatchets of fibrolite, greenstone, serpentine, and jade; No. 17 is the cast of a flat ring of jade found nearly in the centre of the dolmen, upon the floor, with the point of the jade hatchet, No. 2, resting upon it. Nos. 18 to 23 are casts of pendants made of a material to which M. Damour has given the name of *callais*, but it is not now known from whence this precious stone was obtained; it somewhat resembles turquoise, but it is of an apple-green colour, and translucent.

No less than 91 hatchets of fibrolite obtained from this dolmen were shown at the Paris Exhibition in 1867. They were all perfect, even to the cutting edge. Most of the larger hatchets, however, were broken (it is thought purposely) in two or more

pieces.—See Nos. 24 and 27, Case D 17, from Tumiach, and Nos. 5 and 11, Case D 16, from Mont Saint-Michel.

Nos. 24 to 32 are casts of hatchets, &c., from the dolmen of Tumiach (Arzon).

D 18.

In this Case is exhibited a series of the large nuclei found near Pressigny le Grand (Indre et Loire), known from their form by the local name of *livres-de-beurre*. It is now generally held that the region around Pressigny was the site of an ancient and extensive manufactory of flint implements, which appear to have formed an object of barter or traffic, for implements made from the peculiar flint of Pressigny occur at distant places.

The nuclei from Pressigny have had a number of lateral chips removed, as seen in Nos. 1 to 5. This was done in order to govern the form of the long flakes, to be subsequently struck off, and which were intended for daggers, lance-heads, &c.

D 15.

As a temporary arrangement, the upper part of Case D 15 has been filled with specimens from widely-scattered localities, and from which but few examples exist in the collection.

AFRICA.

Upon tablets 22 to 27, and 34 to 36, are shown some human-worked flakes of quartzite from the neighbourhood of the Cape of Good Hope.

EAST INDIES.

Upon tablets 28 to 30 are cores and flakes of agate, jasper, &c., from Jubbulpore, Central India, presented by Sir Charles Lyell, Bart. These specimens with many others were found by the late Lieut. Swiney. The materials used have been obtained from the local trap formation; the cores and flakes occur in abundance along the edge of the trap country; they are chiefly met with on gentle rises, but rarely found scattered over alluvial plains.

Upon tablet 31 are two cores from the Indus valley, Scinde. These are said to have been found four feet beneath the surface of the bed of the river Indus, in a deposit of gravel about two feet thick; the material probably partakes of the nature of a quartzite rather than that of a true flint. They were presented to the collection by the Bedfordshire Archæological Society, to whom several specimens had been given by Captain John Le Mesurier, the finder of them.

ARABIA.

Upon tablet 39 are flakes found at the ancient turquoise mines

in the Wady Magarah, Mount Sinai, which were worked by the Egyptians as early as the 5th dynasty.

EGYPT.

Upon tablet 32 is a stone hatchet of peculiar form, said to be of ancient Egyptian manufacture.

Upon tablet 33 is the cast in sulphur of a small celt of dark green nephrite, or jade, 2 inches long, $1\frac{1}{2}$ inches broad, brought from Egypt by Colonel Milner in 1812. Each of its faces is engraved with a Gnostic formula in the debased Greek character current at Alexandria during the third and fourth centuries. One of these formulæ is in the fashion of a wreath composed of fourteen leaves, each of them engraved with Gnostic charms.

THE ANCIENT LAKE-DWELLINGS OF SWITZERLAND.

THE collection of objects exhibited from the lake-villages (*pfahlbauten*) of Switzerland is large and interesting. It was formed by Admiral the Honourable E. A. J. Harris, C.B.—then H. M. Minister at Berne, who obtained in so doing the valuable assistance of Dr. Keller, Dr. Uhlmann, the late M. Troyon, and other eminent Swiss archæologists. Professor Rüttimeyer has also enriched the collection by adding a fine series of animal remains illustrative of the fauna of the *pfahlbauten*; unfortunately these specimens cannot be exhibited from want of space.

ORIGINAL DISCOVERY OF THE LAKE-DWELLINGS.

So early as the year 1829, piles and other antiquities were discovered in deepening the harbour in front of Ober Meilen, on the Lake of Zurich; but the matter was not then followed up. The earth dug out, and all contained in it, was taken in boats and sunk in the deeper parts of the lake.

The dry winter of 1853-54 reduced the level of the lakes lower than had ever been previously known. The water-mark of 1674 upon the stone of Stäfa was the lowest recorded, but in 1853-54 the water-level was one foot below this mark: consequently, in some places a broad strand was left uncovered along the margin of the lakes, and shallows in them were converted into islands. Taking advantage of this circumstance, the inhabitants of Ober Meilen reclaimed a piece of land, which they enclosed with walls, and raised the level of the included space

with mud dredged from the lake. In dredging this mud numbers of piles, stags' horns, implements, and other objects were found. A reference to Plan 1, in Case K 4, will show the places at which these excavations were made. M. Aepli of Meilen was the first person to draw attention to these objects. Subsequently Dr. Keller conducted further researches at Meilen, which he followed up by similar investigations in other lakes. The result has established the fact that the early inhabitants of Switzerland constructed some, at least, of their dwellings above the surface of the water, in which they probably lived in a similar manner to those Pæonians whose habits have been described by Herodotus.

ANCIENT AND MODERN NOTICES OF PILE-DWELLINGS.

Some of the Pæonians, a Thracian tribe, lived in huts supported upon piles driven into the bed of the lake Prasias in Pæonia (part of modern Roumelia). The following passage from Herodotus describes these dwellings and the habits of the people :—

“They, on the other hand, who dwelt about Mount Pangæus and in the country of the Doberes, the Agrianians, and the Odontians, and they likewise who inhabited lake Prasias, were not conquered by Megabazus. He sought indeed to subdue the dwellers upon the lake, but could not effect his purpose. Their manner of living is the following: platforms supported upon tall piles stand in the middle of the lake, which are approached from the land by a single narrow bridge. At the first the piles which bear up the platforms were fixed in their places by the whole body of the citizens; but since that time the custom which has prevailed about fixing them is this: they are brought from a hill called Orbelus, and every man drives in three for each wife that he marries. Now the men have all many wives apiece, and this is the way in which they live. Each has his own hut, wherein he dwells, upon one of the platforms; and each has also a trap-door, giving access to the lake beneath; and their wont is to tie their baby children by the foot with a string to save them from rolling into the water. They feed their horses and their other beasts upon fish, which abound in the lake to such a degree that a man has only to open his trap-door and to let down a basket by a rope into the water, and then to wait a very short time, when up he draws it quite full of them.”

Many savage and semi-savage tribes live in pile-dwellings at the present day. The fishermen of Lake Prasias still inhabit

wooden cottages built over the water as in the time of Herodotus. The city of Tcherkask is built over the Don. The city of Borneo is altogether built upon piles; and similar constructions have been described by various travellers in New Guinea, Celebes, Solo, Ceram, Mindanao, the Caroline Islands, and elsewhere. Dumont D'Urville thus describes the city of Dorei in New Guinea.

"The inhabitants are distributed in four villages at the edge of the water. Each village contains from eight to fifteen houses built on piles; but each house is composed of a row of distinct cells or cabins, separated by a passage which runs from end to end. These buildings are entirely made of wood, very roughly worked; they show the light through in all directions, and often shake when anyone walks over the floor."

The fishermen's huts which still existed in the river Limmat, near Zurich, at the end of the last century, were of a similar nature.

The Bishop of Labuan thus describes the dwellings of the Dyaks:—"They are built along the river-side, on an elevated platform twenty or thirty feet high, in a long row; or rather it is a whole village in one row of some hundreds of feet long. The platforms are first framed with beams, and then crossed with laths about two inches wide and two inches apart, and in this way are well ventilated; and nothing remains on the floors, but all refuse falls through and goes below."

Captain Burton mentions a visit to an African tribe, the Iso, who, during some forgotten war, fled from Dahome, and established themselves in a lagoon marked in our charts as the Denham Waters. "The Dahomean King is sworn never to lead his army where canoes may be required; these Iso, therefore, have built their huts upon tall poles, about a mile distant from the shore. Their villages at once suggest the Prasian lake-dwellings of Herodotus, and the crannoges of Ireland and the Swiss waters. The people are essentially boatmen; they avoid dry land as much as possible, and, though said to be ferocious, they are civil enough to strangers. In June, 1863, I moored my little canoe under one of their huts, and I well remember the grotesque sensation of hearing children, dogs, pigs, and poultry actively engaged aloft."

STRUCTURE OF LAKE-DWELLINGS.

I. SUBSTRUCTURE.

1.—*Pile-dwellings*.—What may especially be called pile-dwellings are by far the most numerous variety of lake-habitation in Switzerland and Upper Italy. The ideal restoration in Case D 21, made under the direction of Dr. Keller, will give a general notion of the construction of this form of lake-dwelling. Piles of various kinds of wood, sometimes split, but in general mere stems with the bark on, sharpened sometimes with the aid of fire, sometimes with stone hatchets, and in later times with tools of bronze and probably of iron, were driven into the shallows of the lakes, provided they were not rocky, at various distances from the shore. These piles were placed sometimes close together, sometimes in pairs, sometimes tolerably wide apart, generally in regular order, but occasionally in apparent confusion. In every instance the heads of the piles were brought to a level, and then the platform beams were laid upon them, which in some cases were fastened by wooden pins, in others mortises or central hollows were cut in the heads of the vertical piles to receive the cross beams. Occasionally cross timbers were joined to the upright piles below the platform to support and steady the structure, either forced in as it were between them or fastened to them by what workmen call “notching,” that is, portions were cut out of the vertical piles to receive the cross timbers. The platform lying on the top of this series of piles appears in many cases to have been of the rudest construction, and to have consisted merely of one or two layers of unbarked stems lying parallel one to another; in a few cases, as in one of the Italian lake-dwellings, they were composed of boards, split out of the trunks of trees, and joined with some approach to accuracy.

In many instances the outer row of piles appears to have been covered or closed in by a kind of wattle or hurdle work, made of small twigs or branches, probably to lessen the splash of the water, or to prevent the piles from being injured by floating wood.

The distance of these lake-villages from the shore varied considerably; there appears to have been no regular rule in this respect; it may, however, be well to mention that when a lake-dwelling has been inhabited both in the Stone and in the Bronze period, that part referable to the Bronze period is usually further from the shore and deeper in the lake than that which belongs

to the age of Stone. With this exception, as far as can be ascertained, nearly the same mode of construction prevailed in the pile-dwellings during the Stone, Bronze, and Iron periods.

Some few of the lake-settlements appear to have almost touched the shore, but this is exceptional: most of them are at some little distance from it, and in all probability they were connected with it by a narrow platform or bridge supported by piles; in some instances the remains of these bridges have been discovered.

In certain cases, as near Nidau, the pile-dwellings have another peculiarity: they are formed on artificial mounds in the bottom of the lake, made by a large number of stones, which have evidently been brought in boats and sunk on the spot; in fact, one boat, still loaded with the stones which proved too great a cargo for it, and which consequently sunk it to the bottom, is still to be seen at Peter's Island in the Lake of Bienne. This mode of construction (Stein-berg) is not uncommon, especially in the western lakes.

It is impossible, according to the opinions of the best engineers, to drive piles into a heap of stones, consequently the piles must first have been driven more or less deeply into the mud, and the stones must then have been thrown down between and around them, in order to consolidate the structure.

2. *Fascine-dwellings*.—Some lake-dwellings were not supported on piles, but rested upon layers of sticks, or small stems of trees, built up from the bottom of the lake, till the structure reached above the watermark, and on this the platform for the huts was placed. Numerous upright piles are found in dwellings of this description; they were not used, however, to support the platform as in the pile-dwellings proper, but served as stays to the great mass of sticks, which reached down to the bottom of the lake. Fascine-dwellings occur chiefly in the smaller lakes, and apparently belong to the Stone period.

3. *Crannoges, or "Wooden-islands."*—These singular structures bear a great resemblance to the class last described. They have hitherto been found chiefly, if not entirely, in Ireland and Scotland. They were first brought into notice by Sir W. R. Wilde, in the proceedings of the Royal Irish Academy for 1840, and several were subsequently described by Mr. Shirley and other writers. The Catalogue of the Museum of the Royal Irish Academy contains notices of several crannoges. They have also been found in some of the Scotch lakes, especially in Dowalton Loch, which was drained by Sir Wm. Maxwell of Monreith.

Several crannoges then discovered have been described by the Duke of Northumberland and Mr. John Stuart. The crannoges, at least in Ireland, were frequently, but not exclusively, placed on natural islands, or on shallows which approached to this character; sometimes they were built up from the bottom of the lake on the soft mud, exactly in the manner of the fascine-dwellings of Switzerland. They are surrounded by a stockade of piles driven into the bed of the lake, so as to enclose either a circle or an oval; the diameter varies from 60 to 130 feet. These piles are usually in a single row, but sometimes the rows are double and even treble. Occasionally the piles are beams, not round stems. The lowest bed within this enclosure is commonly a mass of ferns, branches, and other vegetable matter, generally covered over with a layer of round logs, cut into lengths of from four to six feet, above which is usually found a quantity of clay, gravel, and stones. In almost every case a collection of flat stones was discovered near the centre of the enclosure, apparently serving as a hearth; in some instances two or three such hearths were discovered at different parts of the crannoge. Generally one or more pair of querns were found.

2. SUPERSTRUCTURE.

Under this head there is naturally very little to be said. Except under very peculiar circumstances, timber and vegetable material cannot possibly exist long when exposed to the summer's sun and the winter's storms. Still there are indications, although slight ones, as to the construction of the huts.

Upon the main platform it appears that a bed of mud, loam, and gravel was laid, and beaten down firmly, either by the feet or by wooden mallets, of which several have been found. Occasionally a layer of larger pebbles is met with near the top, as in some of the Italian dwellings; probably this was intended to strengthen the plaster floor.

There can be no doubt that small piles or stakes formed the framework of the huts. Some of these have been actually found projecting considerably above the platform. Probably in some cases, especially in the fascine buildings, piles were driven in for this purpose, which did not go quite down to the bottom of the lake; but in the regular pile dwellings, they would only be piles of an extra length.

Of course these piles would mark out the extent of the dwellings themselves, and in one or two favourable instances the ground-plan of a settlement has thus been indicated; we have, however,

more than this: the size of the house is further marked out by boards forced in firmly between the piles, and resting edgewise on the platform, thus forming what at the present day we should call the skirting boards of the huts or rooms. It cannot now be determined whether this was continued higher than a single board, as no more than this has yet been discovered; but the advantage of even a single plank, set on edge, to keep out wet, wind, and vermin is quite evident. It is also certain that the walls or sides were in a great measure made of a wattle or hurdle-work consisting of small branches, woven in between the upright piles, and covered with a considerable thickness of loam or clay. This is proved by the presence of numerous pieces of half-burnt clay, upon which the impressions of the wattle-work still remain. These singularly illustrative specimens are found in nearly every settlement which has been destroyed by fire.

The evidence which has been collected proves that the greater number of the huts were rectangular; but some of them may possibly have been round; from ancient authors, it is very evident that the huts of many nations on *terra firma* were round in form, and remains of some ancient circular huts have been discovered in a lake-dwelling in Mecklenburg.

It is not known whether the huts were divided into several rooms or not; possibly further discoveries may decide this. From the remains of straw and reeds found in every lake-dwelling, it seems almost certain that the huts were thatched with these materials, and it is highly probable that the dormitories were strewn with the softer kinds of straw or hay.

Every hut had its hearth, consisting of three or four large slabs of stone; and it is probable, from the almost universal prevalence of clay weights for weaving, that most, if not all, of them were furnished with a loom. Portions of young trees with the branches partially lopped off are also not uncommon in these dwellings; these would be very convenient, if fastened to the roof or the walls, for the suspension of the mats, the tools, the nets, or the earthenware vessels, some of which seem to have had rope handles.

The objects exhibited in the Blackmore Museum have been obtained chiefly from the settlements at Moosseedorf, Robenhäusen, and Wangen—all of which stations belong to the Stone period.

MOOSSEEDORF.

The small lake of Moosseedorf, distant about two hours' walk from Berne, belongs, as its name imports, to that numerous class

of lakes in Switzerland called "Moor lakes." Its banks are boggy, the bottom is muddy, and the water is thick in summer. After the water level had been lowered about eight feet in the winter of 1855-6, the remains of two settlements were discovered, one at the eastern and the other at the western extremity.

ROBENHAUSEN.

Robenhausen is a pile-settlement on the lake Pfäffikon, to the north of the lake of Zürich.

Some years ago, ancient implements were found in the peat near Robenhausen. In January, 1858, however, remains of an extensive lake-settlement were found by Herr Jacob Messikomer, in that part of the moor known as Himeri.

The lake-dwelling of Robenhausen is situated in the peat moor on the southern side of the lake of Pfäffikon. The space covered with piles is nearly three acres; it forms an irregular quadrangle about 2,000 paces from the ancient western shore of the lake, the whole of this distance now consisting of peat, and about 3,000 from the shore in the opposite direction. It was with this last-named side that the settlement, which of course was formerly entirely surrounded with water, communicated by means of a bridge or stage, of which the piles are still visible. The reason why the communication with the land was made in this direction, and not on the side where the land was nearer, appears to be that the gardens and pastures of the colony lay in the sunny district of the village of Kempten.

The substructure of these dwellings was of piles, consisting partly of whole and partly of split stems ten or eleven feet long, of oak, beech, and fir-wood, sharpened at the end with stone-hatchets, and driven a few feet deep into the mud at a distance of from two to three feet apart.

Later discoveries enabled Herr Messikomer to distinguish the piles of the different settlements from the nature of the wood and the character of the workmanship.

The floor or platform supporting the huts was formed, as is evident from the remains still existing, partly of cross-timbers and partly of boards, which were fastened to the upright piles by wooden pins. The outermost piles are bound together with hurdle-work of branches, large pieces of which have been found.

WANGEN.

When the first account was published of the discovery of pile-dwellings, at Meilen, Herr Löhle remembered having seen simi-

lar remains near his house at Wangen, and accordingly, in the autumn of 1856, he began to collect the antiquities found on the shore of the Untersee. He subsequently excavated and laid bare a considerable portion of the area occupied by the lake-dwelling, and was rewarded by the discovery of several things not previously met with, such as ears of barley and woven linen cloth, besides a very large number of stone and bone implements.

The lake-settlement of Wangen lies to the east of the village; the piles run along the shore, now partially encroaching upon it, and form a parallelogram of more than seven hundred paces long and one hundred and twenty paces broad.

The piles consist of the different kinds of wood growing in the neighbourhood—viz., oak, beech, elm, birch, fir, ash, alder, maple, and two kinds of willow. They are either whole stems, or they are trunks split into two or three parts; and they have been sharpened in some cases by fire, and in others with stone hatchets.

They were driven in for the most part one or more feet apart, so that in the space of a square rod at least twelve, though sometimes seventeen or twenty-one may be seen. In some places, however, where a firmer support was necessary, three or four piles are found driven in close together. The whole number of piles forming the substructure of this settlement is estimated by Herr Löhle at from 40,000 to 50,000.

THE OBJECTS FROM THE PILE-DWELLINGS OF SWITZERLAND
ARE EXHIBITED IN CASES A 31 TO A 33, B 26 TO B 29,
C 19 TO C 21, AND D 20 AND D 21.

A 31.

In this Case are some stag's horn hafts for stone hatchets: some of the hatchets being still in the original sockets. They are chiefly from Robenhausen and Wangen; some pointed bone tools are also shown from the same localities.

A great number of the stone implements found at Meilen were still in the original sockets, made of stag's horn. A piece of the antler was cut of the requisite length and thickness, in which a hole was worked out at one end, wide and deep enough to receive the upper end of the hatchet. The other end was cut into a four-sided tenon or plug, which fitted into the wooden handle. The perfect implement, complete in all three parts, has been found at some of the stations. See models from Moosseedorf and Concise, upon the top of Case H 8, the

originals of which are in the collections of Dr. Uhlmann and the late M. Troyon; the latter collection is now preserved in the Public Museum at Lausanne.

A 32.

Nos. 1 and 13 are pieces of stone, showing marks of sawing. The other specimens in this Case are stone hatchets from Wangen, some of which, such as Nos. 6 and 8, appear to have been blunted by use.

The mode by which stone hatchets were made by the lake-dwellers has been described by the late M. Troyon. The block of stone was in the first place reduced to a suitable size with a hammer stone; the outline was marked out by grooves worked to a depth sufficient to weaken the stone, and the projecting portions were then removed by a skilful blow with a hammer, after which the implement was smoothed and sharpened upon a flat grinding stone. The specimens Nos. 1 and 13, in this Case, show marks of sawing, and many of the hatchets have similar marks half way through their thickness. The lake-dwellers worked bone in a similar manner. See No. 23, Case D 20.

A 33.

Contains a series of stone hatchets. Nos. 1 to 11 are from Wangen; Nos. 12 to 19 from Moosseedorf; Nos. 20 and 21 from Concise; Nos. 22 to 26 from Lausanne; and Nos. 27 to 41 from Robenhausen.

D 20

Contains portions of the piles from Moosseedorf, Nos. 32 to 34. The head of a pile, with a mortise cut in it to receive the timber of the platform, found at Robenhausen, has been figured by Mr. Lee. Similar heads of piles were found at Niederwyl. Specimens of various kinds of wood, Nos. 35 to 39, are shown from Moosseedorf; Nos. 16 to 20, and 24 to 30, are pieces of stag's horn partly worked into mounts for hatchets; No. 27 is made into a chisel; No. 31 is a portion of a shed antler of red deer, showing marks of hacking with some rude tool, probably a stone hatchet; Nos. 21 and 23 are fragments of bone, bearing marks of sawing and human workmanship; Nos. 9 to 15, and 40 to 53, are fragments of pottery from Moosseedorf, Robenhausen, and Wangen.

The potter's wheel was probably unknown to the lake-dwellers of the Stone period; the baking of the pottery is very

imperfect, and appears to have taken place in an open fire. The material is usually rude and coarse. Many of the vessels have small projections, which are pierced in such a manner that strings might be passed through them to serve as handles. Some of the vessels, also, are pierced by small holes at different levels; it has been suggested that these may have been used in the preparation of curds, the small holes being intended to permit the escape of the whey. No representation of any animal or vegetable has yet been met with upon the pottery from the pfahlbauten.

Nos. 1 to 5 are portions of grindstones for hatchets, from Wangen, Concise, and Moosseedorf.

No. 6 is a mass of baked clay from Wangen, probably part of the wattle-work of one of the dwellings.

D 21

Contains the ideal restoration of a pile-dwelling, made under the direction of Dr. Keller (scale one-twentieth of supposed dimensions). Nos. 30 to 45 are fragments of pottery, chiefly from Wangen. Nos. 11 to 15 are bone tools; No. 16, bones split for the extraction of marrow; Nos. 17 and 19, gnawed bones; Nos. 20 and 21, bones and teeth of beaver; and No. 22 are the bones of some bird.

FLORA OF THE LAKE-DWELLINGS.

All the cultivated plants of the pfahlbauten show a connection with the countries of the Mediterranean; every kind of corn came from that quarter; the lake-dwellers not only cultivated the same barley, but even the same variety as the inhabitants of Southern Italy. Lest it might be supposed that seeds and objects of later times have become mixed with those belonging to the lake-settlements, it is satisfactory to know that in the old seeds, the inside portions, the germ and albuminous part, have disappeared, and only the burnt cellular part, which forms the seed-shell, or pericarp, has remained.

In Case K 4 are representations of the various cereals found in the lake-dwellings.

Figs. 1 to 8.—Small lake-dwelling barley (*Hordeum hexastichum sanctum*).

Fig. 9.—Compact six-rowed barley (*H. hexastichum densum*).

Figs. 10 to 13.—Ancient Italian silver coins. The six-rowed barley is faithfully delineated on the most ancient coins of Metapontum, see Fig. 10, which represents a coin belonging to

about the 6th century B.C. This barley is still more accurately given on coins of the 5th century B.C. (Figs. 11 and 12). On the coins of Leontini (Fig. 13), an ancient Sicilian town, grains of the ancient type of barley are represented; they exactly agree with those of the small lake-dwelling barley.

Figs. 14 to 18.—Small lake-dwelling wheat (*Triticum vulgare antiquorum*).

Fig. 19.—Beardless compact wheat (*Triticum vulgare compactum muticum*).

Fig. 20.—Egyptian wheat (*Triticum turgidum*).

Fig. 21.—Grains of the above.

Fig. 22.—Spelt (*Triticum spelta*).

Fig. 23.—Lake-dwelling "Emmer" (*Triticum dicoccum*).

Fig. 24.—Oat (*Avena sativa*).

Fig. 25.—Rye (*Secale cereale*).

Fig. 26.—Millet (*Panicum miliaceum*).

Fig. 27.—Single grains magnified.

Fig. 28.—Italian setaria (*Setaria Italica*).

Fig. 29.—Grains magnified.

THE SEEDS FROM THE LAKE-DWELLINGS IN THE COLLECTION ARE SHOWN IN

B 26.

CEREALS.

Tablet 1.—Compact six-rowed barley (*Hordeum hexastichum densum*), Robenhausen.

Tablet 2 (*a*).—Small lake-dwelling wheat (*Triticum vulgare antiquorum*), Robenhausen.

(*c*).—Beardless compact wheat (*T. vulg. compactum muticum*), Robenhausen.

(*b*).—Compact six-rowed barley (*Hordeum hexastichum densum*), Robenhausen.

(*d* and *f*).—Portions of ears of compact six-rowed barley (*H. hexast. densum*), Robenhausen.

(*e*).—Small lake-dwelling barley (*H. hexast. sanctum*), Robenhausen.

Tablet 3.—Wheat (in masses), Wangen.

Tablet 4, (*a*, *b*, and *c*).—Small lake-dwelling wheat (*T. vulgare antiqu.*), Robenhausen.

Tablet 5, (*a*).—Beardless compact wheat (*T. vulgare compactum muticum*), Moosseedorf.

Tablet 5, (b).—Small lake-dwelling wheat (*T. vulg. antiq.*), Moosseedorf.

Tablet 6.—A mass of wheat taken from a barn at Winterborne Monkton, Wilts, which was destroyed by fire in April, 1864. This is exhibited to show how closely the condition and appearance of the grains correspond with those from the pfahlbauten.

Of the cereals from the lake-dwellings, the small lake-dwelling barley (*Hordeum hexastichum sanctum*), and the small lake-dwelling wheat (*Triticum vulgare antiquorum*), are the most ancient. Next to these come the beardless compact wheat (*Triticum vulgare compactum muticum*), and the larger six-rowed barley (*Hordeum hexastichum densum*).

It is believed that the lake-dwellers prepared and sowed their fields in the spring, and not in the autumn.

It is also probable that the corn was not cut off just under the ears (a mode represented on some Italian coins), but that the straw was taken with it; otherwise there would not have been the seeds of so many weeds with the corn.

B 26.

Upon tablets 7 and 8, are specimens of bread (burnt) from the stations of Robenhausen and Wangen.

When the Aa canal (Robenhausen) was deepened and altered, the quantity of bread found was considerable. The entire weight was about 8lb., which would probably correspond with newly-baked bread weighing about 40lb.

This bread should more correctly be called cake, for no leaven appears to have been used. The cakes have been met with both round and flat, from one inch to fifteen lines thick, and with a diameter of four or five inches.

The bread hitherto found has been made of wheat or millet. Barley bread has not been met with; this grain was probably eaten parched or roasted.

B 26.

WEEDS OF THE CORNFIELD.

Tablet 4 d.—Seeds of white goosefoot (*Chenopodium album*).—These seeds of weeds appear to have been equally charred with the grains of corn, and probably were mixed with them. One of the most interesting facts connected with this subject is the presence of two weeds of the cornfield, which are not indi-

genous to Switzerland, but were probably imported with the seed corn, the Cretan catchfly (*Silene Cretica*), and the corn blue-bottle (*Centaurea cyanus*); the former is spread over all the countries of the Mediterranean, and is found in the flax-fields of Greece, Italy, the South of France, and the Pyrenees; the original home of the corn blue-bottle is Sicily. The presence of these weeds indicates the way by which corn had come into the hands of the Swiss lake-dwellers.

Upon Plate lxxxvii., Case K 4, will be found representations of the weeds of the cornfield, obtained from the lake-dwellings.

Fig. 30-31.—Cretan catchfly (*Silene Cretica*).

Fig. 32.—Corn-cockle (*Agrostemma githago*).

Fig. 33.—White campion (*Lychnis vespertina*).

Fig. 34.—Sandwort (*Arenaria serpyllifolia*).

Fig. 35.—Goosegrass (*Galium aparine*).

Fig. 36.—Burdock (*Lappa major*).

Fig. 37.—Corn bluebottle (*Centaurea cyanus*).

Fig. 38.—Spurry (*Spergula pentandra*).

Fig. 39.—Creeping crowfoot (*Ranunculus repens*).

Fig. 40.—White goosefoot (*Chenopodium album*).

Fig. 41.—Striped-seeded goosefoot.

Fig. 42.—Darnel (*Lolium temulentum*).

B 26.

CULINARY VEGETABLES.

Tablet 17 (a).—Seeds of parsnep (*Pastinaca sativa*).

See Plates lxxxvii. and lxxxviii., Case K 4, for figures of other culinary vegetables found in the pfahlbauten.

Fig. 43.—Parsnep (*P. sativa*).

Figs. 44-47.—Celtic field-bean (*Faba vulgaris Celtica*).

Fig. 48.—Pea (*Pisum sativum*).

Fig. 49.—Lentil (*Ervum lens*).

B 26.

FRUITS AND BERRIES.

Tablet 13.—Crab apples (*Pyrus malus*), Robenhausen.

Tablets 14 and 15.—Cultivated apple, larger round lake-dwelling apple (*Pyrus malus cult.*); these have been sliced. Robenhausen.

Tablet 16 (e).—Apple pips. Robenhausen.

The carbonised apples found upon the sites of the lake-dwellings, are sometimes whole, but more frequently cut into halves. Large quantities have been found at Robenhausen; 300, or about half a peck, were found together.

Tablet 22 (c).—Cherry stones (*Prunus avium*).

Tablet 22 (a).—Sloe stones (*Prunus spinosa*).

Tablet 22 (b).—Bird cherry stones (*Prunus padus*).

Tablet 23 (b).—Bird cherry stones (*P. padus*). Of stone fruit more sloe than cherry stones have been found.

Tablet 16 (c).—Raspberry seeds (*Rubus idaeus*).

Tablet 16 (b).—Strawberry seeds (*Fragaria vesca*).

Tablet 16 (d).—Seeds of the dog rose (*Rosa canina*).

Tablet 16 (a).—Seeds of the common elder (*Sambucus nigra*).

See Plate lxxxviii., Case K 4, for figures of other fruits and berries found in the pfahlbauten.

Fig. 50.—Service-tree (*Pyrus aria*).

Fig. 51.—Dog-rose (*Rosa canina*).

Fig. 52.—Elder (*Sambucus nigra*).

Fig. 53.—Dwarf elder (*Sambucus ebulus*).

Fig. 54.—Bilberry (*Vaccinium myrtillus*).

Fig. 55.—Wayfaring tree (*Viburnum lantana*).

B 26.

NUTS.

Tablets 9 to 12.—Hazel-nuts (*Corylus avellana*), Robenhausen and Moosseedorf.

Tablet 17 (b).—Beech mast (*Fagus sylvatica*), Robenhausen.

Tablets 20 and 21.—Water-chestnut (*Trapa natans*), Moosseedorf and Robenhausen.

Tablet 21 (a).—A recent specimen of *Trapa natans*, from Syracuse, for comparison.

Dr. Heer has suggested that the quantities of beechnuts and acorns which have been met with, were probably intended as food for the swine.

The water-chestnut now only exists in Switzerland, in a tarn in the canton of Lucerne. It doubtless formed an article of food with the ancient lake-dwellers, who appear to have laid up stores of it; it is used for food, at the present day, in Upper Italy.

See Plate lxxxviii., Case K 4, for figures of fruits and berries found in the pfahlbauten.

Figs. 56 to 60.—Hazel nuts (*Corylus avellana*).

Figs. 56 and 57 represent nuts which have been bored by the nut-beetle.

Fig. 60 represents a nut which has been gnawed by a mouse. See specimen on Tablet 9, Case B 26, which has been similarly gnawed.

Fig. 61.—Leaf of nut bush.

Fig. 62.—Beechnut (*Fagus sylvatica*).

Fig. 63.—Covering of the beechnut.

Fig. 64.—Water-chestnut (*Trapa natans*).

B 26.

OIL-PRODUCING PLANTS.

Tablet 17 (*a*).—Seeds of the opium, or garden poppy (*Papaver somniferum* var. *antiquum*), Robenhausen.

(*d*).—Seeds of dogwood (*Cornus sanguinea*), Robenhausen.

Tablet 23 (*b*).—Seeds of dogwood (*C. sanguinea*), Moosseedorf.

Tablet 18 (*a*).—Seeds of henbane (*Hyoscyamus niger*), Robenhausen.

See Plate lxxxviii., Case K 4, for figures of seeds of oil-producing plants found in the pfahlbauten.

Fig. 65.—Young heads or seed vessels of garden or opium poppy.

Fig. 66 (*a*).—A small piece of the poppy cake.

(*b*).—Poppy seed, magnified.

Fig. 67.—Dogwood (*Cornus sanguinea*).

AROMATIC PLANTS.

Caraway seeds have been found in the lake-dwellings, but no specimens are in the Collection.

B 26.

BAST AND FIBROUS PLANTS.

Tablet 18 (*b*, *c*, and *d*).—Flax seeds (*Linum angustifolium*), Robenhausen.

The flax of the lake-dwellers is not the common flax. The small-leaved flax (*Linum angustifolium*), which is a native of the countries of the Mediterranean, may be considered as the original stock of the cultivated flax of the lake-dwellers. The presence of the Cretan catchfly proves that the flax-seed came, originally, from Southern Europe.

See Plate lxxxviii., Case K 4, for figures of fibrous plants found in the pfahlbauten.

Figs. 68 to 77.—Lake-dwelling flax (*Linum angustifolium*).
 Fig. 76 represents a piece of linseed cake found at Robenhausen.
 Figs. 78 to 80.—Fruit of the lime tree (*Tilia grandiflora*).

B 26.

PLANTS USED FOR DYEING.

Weld is the only dye plant mentioned by Dr. Heer as having been found in the lake-dwellings; there is no specimen of it in the Collection; it is figured in Plate lxxxviii., Case K 4.

Fig. 81.—Weld (*Reseda luteola*).

B 26, AND D 20.

FOREST TREES AND SHRUBS.

Case B 26, Tablet 27 (*b*).—Scotch fir cone (*Pinus sylvestris*), Robenhausen.

(*a*).—Mountain pine cone (*P. montana*), Robenhausen.

Case B 26, Tablet 28.—Spruce fir cone (*P. abies*), Robenhausen.

Case B 26, Tablet 30 (*a*).—Spruce fir cone (*P. abies*), Moosseedorf.

Case B 26, Tablet 26 (*b*).—Spruce fir cone (*P. abies*), Robenhausen.

Case D 20, Tablet 38 (*a*).—Yew wood (*Taxus baccata*), Moosseedorf.

Case B 26, Tablet 26 (*a*).—Yew seeds (*T. baccata*), Robenhausen.

Case D 20, Tablet 36 (*a*).—Oak wood (*Quercus robur*), Moosseedorf.

Case D 20, Tablet 35.—Birch leaves (*Betula alba*), Moosseedorf.

Case D 20, Tablet 36 (*b*).—Ash wood (*Fraxinus excelsior*), Moosseedorf.

Case B 26, Tablet 24 (*c*).—Mistletoe (*Viscum album*), Moosseedorf.

See Plate lxxxviii., Case K 4, for figures of cones, &c., of trees and shrubs found in the pfahlbauten.

Fig. 82.—Scotch fir (*Pinus sylvestris*).

Fig. 83.—Mountain pine (*P. montana*).

Fig. 84.—Silver fir (*P. picea*).

Fig. 85.—Juniper (*Juniperus communis*).

Fig. 86.—Yew (*Taxus baccata*).

Fig. 87 to 90.—Oak (*Quercus robur*).

Fig. 91.—Hornbeam (*Carpinus betulus*).

Fig. 92.—Mistletoe (*Viscum album*).

B 26.

MOSESSES.

Tablet 30 (b).—(*Anomodon viticulosus*), Moosseedorf.

Tablet 29.—(*Neckera crispa*), Moosseedorf.

B 26.

PLANTS FOR PROCURING FIRE.

Tablet 25.—Common tinder fungus (*Polyporus igniarius*), Robenhausen.

The Iroquois use a fungus which grows on the maple, as *punk* in kindling fire; another kind which is found on the birch is used when the former cannot be obtained. These substances will smoulder, but not burst into flame; they are therefore wrapped in cedar bark which has been pulled by hand to separate the fibres, in which state it readily ignites.

B 26.

WATER AND MARSH PLANTS.

Tablet 31 (e).—Seeds of Chara (*Chara vulgaris*), Robenhausen.

Tablet 32 (e).—Seeds of Lake scirpus (*Scirpus lacustris*), Robenhausen.

Tablet 31 (a).—Seeds of Marsh Scheuchzeria (*Scheuchzeria palustris*), Robenhausen.

Tablet 31 (b).—Seeds of Yellow flag (*Iris pseudacorus*), Robenhausen.

Tablet 32 (b).—Seeds of Pondweed (*Potamogeton perfoliatus*), Robenhausen.

Tablet 32 (a).—Seeds of Pondweed (*P. compressus*), Robenhausen.

Tablet 32 (c).—Seeds of Common hornwort (*Ceratophyllum demersum*), Robenhausen.

Tablet 31 (c).—Seeds of Buckbean (*Menyanthes trifoliata*), Robenhausen.

Tablet 31 (f).—Seeds of Marsh bedstraw (*Galium palustre*), Robenhausen.

Tablet 32 (g).—Seeds of Marsh lousewort (*Pedicularis palustris*), Robenhausen.

Tablet 31 (a).—Seeds of White water-lily (*Nymphaea alba*), Robenhausen.

Tablet 32 (a).—Seeds of Yellow water-lily (*Nuphar luteum*), Robenhausen.

Tablet 32 (b).—Seeds of Yellow water-lily (*N. luteum*), Moosseedorf.

Tablet 32 (f).—Seeds of Water crowfoot (*Ranunculus aquatilis*), Robenhausen.

The character of the water and marsh plants shows that, at least at Robenhausen, the lake-dwellings were not erected over the deep and clear water of the lake, but on muddy shallows overgrown with vegetation.

See Plate lxxxviii, Case K 4, for figures of seeds of other water and marsh plants found in the pfhalbäuten.

Fig. 93.—Lake scirpus (*Scirpus lacustris*).

Fig. 94.—Pondweed (*Potamogeton perfoliatus*).

Fig. 95.—Pondweed (*P. compressus*).

Fig. 96.—Common hornwort (*Ceratophyllum demersum*).

Fig. 97.—Marsh bed-straw (*Galium palustre*).

Fig. 98.—Marsh bed-straw, very much magnified.

Fig. 99.—Buckbean (*Menyanthes trifoliata*).

Fig. 100.—Marsh lousewort (*Pedicularis palustris*).

Fig. 101.—Yellow water-lily (*Nuphar luteum*).

Fig. 102.—Small yellow water-lily (*N. pumilum*).

Fig. 103-104.—White water-lily (*Nymphaea alba ööcarpa*).

Fig. 105.—Marsh Scheuchzeria (*Scheuchzeria palustris*).

Fig. 106.—Lesser spearwort (*Ranunculus flammula*).

Fig. 107.—Ivy-leaved crowfoot (*R. hederaceus*).

Fig. 108.—Marsh pennywort (*Hydrocotyle vulgaris*).

The lake-dwellings were probably inhabited during the whole year, as the undigested remains of food appear to prove. The cherry-stones indicate June; the seeds of raspberries and blackberries the middle and end of summer; the sloes and the seeds of the dog-rose the latter part of autumn; and the hazel nuts and beech nuts refer to the autumn and winter. The presence of remains of the swan, a bird which only appears in the Swiss lake district during very cold winters, in the months of December and January, proves that the lake-dwellings were not abandoned even in the most severe winter weather.

B 27.

In this Case flint implements and worked flints are exhibited. The flint used by the lake-dwellers was probably obtained by barter. This is quite in accordance with what is known to be the practice of modern savages. In

Australia, the special products of each district, pipe-clay and red ochre, drinking cups and cockatoo's feathers, and especially "a much-esteemed kind of flint from the North" are conveyed by barter from tribe to tribe on the vast continent.

Tablets 1 to 6.—Flint, worked and unworked, Moosseedorf.

Tablet 7.—Flint implements, Moosseedorf.

Tablet 8.—Flint scrapers, Moosseedorf.

Tablet 9.—Casts of flint arrow-heads, Moosseedorf. The originals are in the collection of Dr. Uhlmann.

Tablet 10.—Flint arrow-heads, Moosseedorf.

Tablets 11 to 13.—Flint, worked and unworked, Robenhausen.

Tablet 14.—Flint arrow-heads, Robenhausen.

Tablet 15.—Flint saw, in its original wooden handle fastened with asphalt, Robenhausen.

The asphalt used by the lake-dwellers was probably obtained at Val Travers (Canton of Neuchâtel), in Alsace, or at Seyssel, near the "Perte du Rhone."

A lump of asphalt was found at Wauwyl; this may be regarded as raw material taken there for future use.

Tablet 16.—Stone chisels, Robenhausen.

Tablets 17 and 18.—Flint flakes and implements, Wangen.

Tablet 19.—Flint implements, Wangen.

Tablet 19 (*b*).—Flint boring-tool worn towards the point, Wangen.

Tablet 20.—Flint arrow-heads, Wangen.

Flint implements of all kinds are rare at Wangen, probably from the scarcity of the raw material. All the flint arrow-heads in the Collection from Wangen are of the triangular type.

Tablet 21.—Flint implements, Bodensee.

Tablet 22.—Portion of a wooden implement, the point of which has been hardened by fire, Wangen.

Tablet 23.—Twisted cord of woody fibre, Moosseedorf.

Hanks of string have been found at Robenhausen.

Tablet 24 (*b to h*).—Canine teeth of dogs, drilled for suspension.

Tablet 24 (*a*).—Canine tooth of bear, similarly drilled.

B 27.

Upon Tablets 25 and 26 are fæces of goats, sheep, &c., from Robenhausen.

The cattle, their stalls, and winter stores were not kept on land, as was formerly supposed, but on the lake-platforms themselves. Although this statement is based only on the observa-

tions made at Robenhausen, there cannot be the slightest doubt that the manner of life was the same in the other lake-settlements.

Herr Messikomer has discovered in the peat of Robenhausen, horizontal beds from two to ten inches thick, composed entirely of the excrements of cows, pigs, sheep, and goats, together with the remains of the litter they had used. The litter for the cows consisted chiefly of straw and rushes; that for the smaller animals was of sprigs of fir and twigs of brushwood.

At Wangen some straw was found arranged in such a parallel manner as to induce the belief that it had formed part of the thatch of one of the huts.

Tablets 27 and 28.—Spindle-whorls of clay. Bodensee.

Tablets 29 and 30.—Spindle-whorls of clay. Wangen.

Tablet 31.—Hæmatite, probably used for paint. Robenhausen.

Tablet 32.—Wooden float for a fishing line or net. Robenhausen.

B 28.

Tablets 1 and 5.—Portions of fishing nets. Robenhausen.

Tablet 6.—Hanks of spun flax. Robenhausen.

Tablets 2 to 4 }
Tablets 7 to 16 } Specimens of weaving and platting.

Tablets 17 to 20.—Pointed bone tools and chisels. Moosseedorf.

Tablets 21 to 23.—Pointed bone tools and chisels. Robenhausen.

Upon Tablet 23 is a small bone implement pointed at both ends. Robenhausen.

Mr. Lee gives figures of two similar implements of bone pointed at both ends, found at Wangen. One of these is exactly like the specimen exhibited; the other, however, is grooved round the middle where the line would have been attached. This kind of bone implement no doubt was used in fishing: it was completely covered by the bait, and when swallowed it could not easily have been got rid of by the fish. Ducks are caught on the Untersee at the present time with similar implements. Indeed the pointed bone acts like the needle we use in "sniggling" eels; a very similar contrivance for fishing is employed by the aborigines of Australia.

B 29.

Tablet 20.—Pointed bone tools and chisels. Robenhausen.

Tablets 21 to 30.—Pointed bone tools and chisels. Wangen.

Tablets 31 and 32.—Pointed bone tools and chisels. Concise. Presented by the late M. Troyon.

Some of the pointed bone tools, such as those on Tablet 23, are made from ribs split and worked to a point at one end; perhaps these were used in netting or in the manufacture of pottery.

H 8.

No. 6.—Model of a stone chisel, in its handle of stag's horn. The original is in the collection of Dr. Uhlmann, who obtained it from Moosseedorf.

No. 7.—Model of a stone hatchet, with its handle complete. The original is in the collection of Dr. Uhlmann, who obtained it from Moosseedorf.

No. 8.—Model of a stone hatchet, in its handle complete, from Concise. The original formed part of the collection of the late M. Troyon.

No. 9.—Model of a harpoon, with a barbed head of stag's horn. The original handle was 12 feet long; it was obtained from Moosseedorf, and is in the collection of Dr. Uhlmann.

No. 10.—Cast of a portion of the platform of a pile-dwelling at Concise. Cast taken by the late M. Troyon.

C 19.

No. 1.—Scapula of ox, Robenhausen. This has been worked, and used as an implement.

Nos. 2 to 9.—Pieces of stag's horn, which, having been cut partly through, were then broken off by a blow. Robenhausen.

Nos. 11 and 12.—Perforated clay balls (loom weights). Wangen.

No. 13.—Perforated conical loom weight. Robenhausen.

No. 14.—Hearth-stone. Robenhausen.

No. 15.—Hearth-stone. Wangen.

C 20.

Nos. 1 to 6.—Pieces of stag's horn, cut like specimens in C 19.

Nos. 7 to 10, 12.—Stone corn-crushers. Moosseedorf, Robenhausen and Wangen.

No. 13.—Stone hammer. Moosseedorf.

No. 11.—Hearth-stone. Robenhausen.

C 21.

Nos. 1 to 6.—Pieces of stag's horn, cut like specimens in C 19 and 20.

Nos. 2, 3, 4, 5, and 6 have not been cut like the other specimens, but have been sawn.

Nos. 7 and 8, 10 to 14.—Stone corn-crushers. Wangen.

No. 9.—Hearth-stone. Wangen.

The stones used by the lake-dwellers as corn-crushers are of a spherical form, some flattened on two sides like an orange; others almost round, with depressions on the four opposite sides. They are about the size of a man's fist, or rather less, and usually show traces of wear.

A 34, B 29, AND C 22.

FLINT IMPLEMENTS FROM ITALY.

C 22.

Upon Tablets 6 to 11 are waste flakes and rude flint implements from a drift deposit at Ponte Molle, about two miles from Rome. These specimens were found, and presented to the Collection, by the late Rev. R. S. C. Chermiside.

It is doubtful whether the Italian drift implements should be regarded as of equal age with the implements of the Somme valley, and those of Wiltshire, Hampshire, and Norfolk.

A 34.

No. 2 is a stemmed flint arrow-head, found at Cervetri, the ancient Cære, near Rome; it was presented to the collection by the late Rev. R. S. C. Chermiside.

An especial interest is attached to the discovery of stone implements in Italy, as the use of metals was certainly known in that country at a very early period.

B 29.

In this Case casts of stone hatchets and implements, found in Italy, are exhibited.

Upon Tablet 1 are casts of stone hatchets from Nice.

Upon Tablet 3 is the cast of a stone hatchet from Piedmont.

Upon Tablet 2 b is the cast of a stone hatchet from Tanaro.

Upon Tablet 14 is the cast of a hatchet of green porphyry, found at Ceresara, near Guidizzolo.

Upon Tablet 15 is the cast of a drilled axe of green serpentine, found in a turbary, near Laveno.

Upon Tablet 16 is the cast of a broken drilled axe of serpentine, found in Lake Como.

The originals of the three last-mentioned specimens are in the Museum at Milan.

Upon Tablet 13 is the wax model of a leaf-shaped flint spear-head, found at Calindasco, near Plaisance. The original is in the Museum at Lugano.

Upon Tablet 4 is the cast of a stone hatchet from Torée.

Upon Tablet 2 *a* is the cast of a stone hatchet from Ascoli.

B 29.

CASTS AND MODELS OF OBJECTS FOUND IN THE LAKE-DWELLINGS OF LAKE VARESE, LOMBARDY.

As already mentioned, Sig. Stoppani has discovered the sites of five distinct pile-villages in Lake Varese. These have been named Isolino, Cazzago, Bodio, Keller, and Desor. The Abbé Ranchet subsequently discovered a sixth, which is called Bardello. At Bodio station some implements of bronze have been found. At Isolino, and at Keller, the only objects of bronze hitherto met with are some fish-hooks. The flint arrow-heads found at Bodio, at Isolino, and at Keller, are remarkable for the fineness of the workmanship and the length of their barbs. See specimens upon Tablet 12 *d* and *e*, from Isolino; and models of others upon Tablets 11 and 12 *a*, from Bodio.

Upon Tablets 5 and 6 are casts of stones, from Bodio, which appear to have been used for polishing implements.

Upon Tablet 7 are casts of grooved stones, from Bodio, perhaps grooved in sharpening tools. Upon Tablet 21 *a* is the cast of a similar object from the pile-dwelling called Keller, Lake Varese.

Upon Tablet 8 *a* is the cast of a stone hatchet from the central pile-village at Bodio. This specimen appears to have been purposely blunted.

Upon Tablet 8 *b* is the cast of a hatchet of green serpentine, found in a turbary near Cazzago.

Upon Tablet 22 are casts of stone hatchets from the pile-village at Bodio.

Upon Tablet 9 *c* is the wax model of a flint spear-head from the pile-village at Bodio.

Upon Tablet 9 *a*, *b*, *d*, and *e*, upon Tablet 10 *b* and *c*, and

upon Tablet 12 *b* and *c*, are wax models of flint saws (?) from Bodio station, Lake Varese.

Upon Tablet 10 *a* is the wax model of an amulet (?) of micaceous quartzite, in the form of a ring, from Bodio station.

Upon Tablet 11 *a*, *c*, *d*, and *f*, and Tablet 12 *a* are wax models of barbed flint arrow-heads, from Bodio station.

Upon Tablet 12 *d* and *e* are two stemmed and barbed flint arrow-heads, from Isolino station, Lake Varese, presented to the Collection by Mr. J. W. Flower, F.G.S., who has also given many of the casts from the lake-dwellings of Lake Varese.

Upon Tablet 11 *b* is the wax model of a flint spear-head, from the pile-dwellings of Isola Camilla, Lake Varese.

Upon Tablet 11 *e* is the wax model of a leaf-shaped flint arrow-head, also from Isola Camilla.

Upon Tablets 17 to 21 are casts of "spindlewhorls" of stone and terra-cotta from Bodio and Keller stations. 17 *a* only shows the commencement of drilling.

The originals of nearly all the casts exhibited from Italy are preserved in the Museum at Milan.

A 34 AND A 35.

FLINT IMPLEMENTS FROM BELGIUM.

The worked flints exhibited in these Cases were found, together with many similar specimens, on the rising ground to the south-east of Mons, between Spiennes, Nouvelles, and Harmignies; they are most abundant on the lands to the south and south-west of Spiennes. This series formed part of the Toilliez Collection. M. Désiré Toilliez announced the discovery of flint implements near Spiennes to the Academy of Sciences of Belgium in 1847. After the death of M. Toilliez, in 1865, his prehistoric collection passed into the hands of Mr. John Evans, F.R.S., who has presented specimens of the Spiennes implements to several public Collections, including the Blackmore Museum. In 1866, M. C. Malaise attempted to assign these objects to the Quaternary period, and M. Le Hon, in "L'Homme fossile," fell into the same error. Mr. Evans and the late M. Toilliez shared the idea that a manufactory of flint implements had existed near Spiennes, and that the specimens found there are the rejected implements and waste pieces. In this opinion MM. Gabriel de Mortillet, Cornet, A. Briart, and d'Omalus coincide.

Flint implements, bearing a considerable resemblance to

the Spiennes specimens, have been found in some pits in Cissbury Camp, near Worthing, Sussex. The discovery was made by Col. A. H. Lane Fox, F.S.A., in September, 1867. In all, about 600 specimens were found, only one of which was polished; no metal implements were found with them. A good series of the Cissbury implements has been presented by Col. Lane Fox to the Christy Collection. The Rev. Canon Greenwell obtained a large number of flint implements from the Cissbury pits in 1868, and among them were two boring tools.

A 34.

Nos. 4 to 8 are chipped flint implements. Nos. 7 and 12 are flint cores. No. 5 *a* and *b* are flint flakes. The other specimens are rude flint implements, many of which are probably in an unfinished state, or rejected during the process of manufacture.

A 35.

The chipped implements in this Case consist of three principal forms—narrow tools pointed at one end, such as Nos. 15 and 16; ruder implements pointed at both ends, as Nos. 2 and 3; and hatchets with a broad edge for cutting, as Nos. 10 and 13. Nos. 8, 9, 19, 20, and 22 have been polished.

A 34.

GERMANY.

No. 19 is a stone hatchet, found near Quedlinburg, Prussia. (Klemm. Coll., 2432.)

No. 20 is a stone hatchet found at Thale, near Aschersleben, Prussia. (Klemm. Coll., 2090.)

No. 21 is a stone hatchet, very flat on the under side; it was found near Quedlinburg. (Klemm. Coll., 2460.)

Nos. 22 to 24 are drilled stone axes from North Germany.

No. 25 is a stone chisel, and No. 26 is a stone hatchet, both found in Hungary; they have been presented to the Collection by Mr. J. W. Flower, F.G.S.

Nos. 19 to 21 have been presented to the Collection by Mr. Augustus W. Franks, V.P.S.A. Although the series exhibited is so very small, yet a large number of stone implements have been found in Germany.

There is a considerable general resemblance between the flint and stone implements and weapons found in North Germany and those met with in Scandinavia.

SHELL-MOUNDS OF DENMARK.

C 23 AND C 24.

THE objects in these Cases have been obtained from the "Shell-Mounds" and "Coast-finds" of Denmark. The Shell-Mounds, or Kjökkenmöddings, are heaps of shells, mixed with broken bones and other refuse, which have accumulated around the sites of ancient dwellings. At Havelse, the mound is in the form of an irregular ring: the central space was probably the site of the hut, or huts. At one time the Danish shell-mounds were thought to be natural deposits—in fact, "raised beaches;" but this was proved not to be the case, for the shells in them belong entirely to full-grown, or to nearly full-grown, individuals, and consist of four kinds which do not live together, and do not require the same conditions. The Danish shell-mounds are frequently of great extent, being sometimes more than 300 yards long, 10 feet thick, and from 100 to 200 feet broad.

The people who resorted to these spots, to feed upon the shell-fish found close at hand, were probably of migratory habits. Remains of the wild goose are found in the shell-mounds. As this bird is only a winter visitor, it would seem that the shell-mounds were sometimes occupied even in cold and inclement weather. No trace of grain has been met with in the shell-mounds. Bones of the sheep, horse, reindeer, and domestic fowl are absent. Polished stone implements themselves have not been met with in the shell-mounds, but both Mr. John Evans and Professor Steenstrup have found pieces of polished stone hatchets, some of which had been worked up into tools and scrapers.

Shell-mounds, resembling the Kjökkenmöddings of Denmark, have been observed in many parts of the world; indeed, they are still being formed by the Fuegians, and some other savages.

OBJECTS FROM THE KJÖKKENMÖDDINGS OF DENMARK ARE
SHOWN IN CASES C 23 AND C 24.

C 23.

All the specimens exhibited from the shell-mounds and coast-finds of Denmark have been presented to the Collection by Mr. John Evans, F.R.S.

Upon Tablets 8 to 11, and 13 *b*, are flint cores, flakes, and implements, from a shell-mound at Meilgaard. This shell-mound is one of the largest and most interesting hitherto discovered; it is situated in a beautiful beech forest, called "Aigt," or "Aglskov," on the property of M. Olsen, not far from the sea-coast, near Grenaa, in north-east Jutland. The mound is about ten feet thick in the middle, from which, however, it slopes away in all directions; round the principal mound are several smaller mounds of the same nature. Over the shells a thin layer of mould has formed itself on which the trees grow. The entire thickness of the mound consists of shells; oysters being, at Meilgaard, by far the most numerous, with here and there a few bones, and still more rarely stone implements, or fragments of pottery. Excepting just at the top and bottom, the mass is quite unmixed with sand and gravel; and, in fact, contains *nothing* but what has been, in some way or other, subservient to the use of man.

The specimens on Tablets 9 *b*, 10, and 11, are small triangular "axes," which are very characteristic of the coast-finds and the kjökkenmöddings. They are flat on one side, and more or less convex on the other; rudely triangular or quadrangular in shape, with the cutting edge at the broader end, and from $2\frac{1}{2}$ inches to $5\frac{1}{2}$ inches in length, with a breadth of $1\frac{1}{2}$ inches to $2\frac{1}{2}$ inches. They are never ground, and the cutting edge, though not sharp, is very strong, as it is formed by a plane, meeting the flat side at a very obtuse angle. Professor Steenstrup doubts whether these curious and peculiar implements were ever intended for axes; he regards them as having been used as "sinkers," and figures somewhat similar objects which are applied to this purpose by the Esquimaux. The so-called edge, in his opinion, neither has, nor could have, been used for cutting. Sir John Lubbock rather inclines to the belief that they really are "axes," and he figures a kjökkenmödding axe and a special form of New Zealand adze, side by side, in support of his opinion. A cast of this New Zealand adze is shown in Case A 53, No. 14. The original is in the British Museum; it was brought from New Zealand by the Rev. R. Taylor; the edge of this specimen, unlike that of the kjökkenmödding axes, is produced by rubbing.

Upon Tablet 12 is a kjökkenmödding flint axe. Nilsson figures one of these implements and describes it, provisionally, as an "ice-chisel from the Baltic coast."

Mr. Flower, of Croydon, has recently found a flint implement on the surface, near Thetford, which closely resembles this

kjökkenmødding type of axe. One class of the quartzite implements, obtained from the laterite deposits of Madras, have the edge formed by bold flaking, as is the case with the kjökkenmødding axes.

The specimens on Tablets 14 and 15, 13 *a*, are flint flakes and cores from the shell-mound at Sölager; upon Tablet 7 *a*, Case C 24, is a rude pounding-stone or hammer from the same locality.

C 24.

Upon Tablets 5 and 6 are flint flakes and implements from the shell-mound at Havelse; 7 *b* is a rude pounding-stone from the same locality. The shell-mound at Havelse, on the Isefjord, is of small extent, and although close to the shore, is quite beyond the reach of the waves. It is in the form of an irregular ring, enclosing a space on which the ancient dwelling or dwellings probably stood. Upon Tablet 8 is a flint core from the shell-mound at Magleö. Upon Tablet 9 are some flint flakes from the shell-mound at Gundsömagle. Upon Tablet 10 are flint flakes from the shell-mound at Bilidt, on the Isefjord. Upon Tablets 11 to 15 are flint flakes, cores, and rude implements from the "coast-find" at Korsör.

"COAST-FINDS" OF DENMARK.

"Coast-finds" are discoveries of rude flint implements, which are found lying in large numbers on certain spots along the old line of coast. They are called "Kystfunden" by the Danish antiquaries. Owing, probably to the elevation of the land which has taken place in Jutland since the Stone period, some of these "coast-finds" are now on dry ground, and as the shore is very flat, the elevation, slight as it is, has in some cases been sufficient to separate them by a considerable distance from the present water-line. Some, on the other hand, are at lower levels; one, for instance, close to the Railway Station at Korsör, is exposed only at low tide, and others are always covered. The coast-finds probably belong to different classes. Thus, one at Anholt was evidently a workshop of flint implements, as is shown by the character of the chips, and by the discovery of more than sixty flint cores. Those, on the contrary, which even at the present day are under water,

probably were so in old times, and, as there are no traces of lake-dwellings in Denmark, Sir John Lubbock has suggested that they indicate the places where the fishermen, formerly, were accustomed to drag their nets. Mr. John Evans is of opinion that some of the coast-finds may be due to shell-mounds having been destroyed by inroads of the sea.

A 36 TO A 39, C 22 TO C 27.

FLINT AND STONE IMPLEMENTS FROM SWEDEN AND DENMARK.

The immense number of stone implements found in Scandinavia has often been mentioned, indeed the whole country is a museum upon a grand scale. No flint implements of palæolithic types have hitherto been met with in Scandinavia. Sir John Lubbock has failed to find a single specimen in the museums at Copenhagen, Stockholm, Lund, Flensburg, or Aarhus; he has also examined many private collections without discovering any; his opinion is that Scandinavia was not peopled during the Palæolithic period.

STONE HATCHETS.

The typical Scandinavian flint hatchet has straight sides: flint hatchets with oval sections are, however, found in Scandinavia, although they are not at all abundant.

A 36.

Very few of the flint hatchets in this Case have been rubbed or polished. Nos. 3, 11, 12, and 13, however, are exceptions. Nos. 1 and 4 are nicely chipped; Nos. 7 and 17 have the peculiar "crimped" work at the edges seen in perfection upon the handles of some Scandinavian daggers. No. 9 is bruised at the end, as if from being struck with a hammer-stone.

C 22.

Nos. 1, 2, and 5 are rubbed stone hatchets.

No. 4 is a whetstone for hatchets.

GRINDSTONES AND WHETSTONES.

According to Professor Nilsson, these whetstones are usually made of a quartz sandstone belonging to the old transition sand-

stone occurring in strata near Cimbritshamn, Gladsax, Andrarum, and Hardeberga, in Scania. The surface of the whetstones always shows distinct marks of sharpening or grinding. They vary considerably in size and shape. The majority have not been portable, but have been lying in or beside the huts of the natives. Some of them, however, are small, flat, or annular; such a stone may have been carried in the pouch on hunting excursions.

C 22.

Stone implements resembling No. 3, Case C 22, are, with some hesitation, classed by Nilsson as stone anvils; they may have been used as mealing stones, and probably do not belong to a very early period. The under surface of No. 3 is much worn, apparently from rubbing.

C 23.

Nos. 1 to 7, rubbed stone hatchets.

C 24.

No. 1 is a rubbed stone axe; it was perhaps intended to be drilled. Nos. 2 and 3 are drilled stone axes. No. 4 is the upper stone of a quern, probably of late date; it was found at Rendsburg.

A 37.

STONE HATCHETS.

The flint hatchets in this Case are chiefly polished. No. 5 is a fine specimen; it is wholly unrubbed on the under surface, and is probably in an unfinished state. No. 7 shows considerable wear at the cutting edge. No. 10 is greatly bruised at the butt end, as if it had been driven like a wedge by a number of blows. No. 20 is very highly polished. Three tolerably distinct types of hatchet will be observed in this Case.

(a). Hatchets rather thick, and of nearly equal breadth throughout the length of the blade; such as Nos. 5 and 6.

(b). Hatchets tapering in width towards the butt end, and much thicker than *a*; such as Nos. 9, 11, 13, 14, and 16. Some examples of this type curve outward at each side of the cutting edge, such as Nos. 2 and 8.

(c). Hatchets resembling *b* in form, but much thinner and usually more highly polished than either *a* or *b*; such as Nos. 17, and 19 to 22.

A 38.

Nos. 1 and 2 are flint hatchets.

STONE GOUGES.

Nos. 3 to 13 are flint and stone gouges. Nos. 3 to 5 are unfinished. No. 8 is a good specimen; the present state of its edge shows that it has been used and then reground at a different angle.

The butt end of No. 7 is much bruised from use.

Flint gouges, although common in the north of Europe, are rarely found in Great Britain or Ireland. Stone gouges have been met with in North America.

STONE CHISELS.

Nos. 14 to 20 are flint chisels. These tools are rarely found in Scandinavia made of any other material than flint. Professor Nilsson, however, possesses a chisel of diorite. No. 20 is very broad, and in form connects the chisels with the hatchets. No. 14 is unfinished; it is rudely chipped into form. Nos. 16 and 18 are bruised at the butt end from use.

WHETSTONES AND POLISHING STONES.

No. 21 is a whetstone similar to No. 4, Case C 22. It is grooved from use. Nos. 22 and 23 are whetstones of different forms. Nos. 24 to 26 are polishing-stones; they belong, however, to a late period; the surface of No. 24 is much smoothed from use. Not less than a hundred similar whetstones have been found in the peat-mosses at Thorsbjerg, and Nydam, in South Jutland, associated with objects of the Early Iron Period. It has been suggested that the groove which is worked round these objects served for the reception of a cord by which they were carried hanging from the girdle. Nilsson classes these objects as hammer-stones; he considers that the edges of stone tools have been struck against the grooved sides of these implements, in order to sharpen them.

SPINDLE-WHORLS AND STONE DISCS.

Nos. 27 to 29 are stone "spindle-whorls." Nilsson classes these objects as beads, and thinks that some of them may have been used as weights for drag-nets.

A 39.

DRILLED STONE AXES.

The specimens in this Case are chiefly drilled stone axes and axe-hammers. Nos. 1 to 6 illustrate different stages in drilling. No. 1 is roughly chipped into form. No. 2 is not only blocked into shape, it is also rubbed; but the drilling has not been commenced. No. 3 shows a slight depression, the mere commencement of a drilled hole. No. 4 is drilled about half way through from one side only. No. 5 has been drilled from both sides; the holes have met, but more work had to be done in order to render the hole of equal diameter throughout. With No. 6 this has been effected. No. 10, and many of the stone axes in this Case, have probably been drilled with tools of metal.

C 25.

FLINT FLAKES AND CORES.

Upon Tablets 3 and 4 are some flint flakes. 4 *b* and *c* have both been worn towards the point in so similar a manner, that it is suggestive of their having been used for some common purpose.

FLINT ARROW-HEADS.

Upon Tablets 5 and 6 are some flint arrow-heads; *e*, tablet 6 is a typical Scandinavian form. It is a long triangular prism, pointed at the top, and with a stem at the base in order to attach it to the shaft. The edges of these arrow-heads are often beautifully serrated.

C 25.

FLINT SPEAR AND HARPOON-HEADS.

Upon Tablets 7 and 8 are flint spear-heads.

SEMI-LUNAR FLINT SCRAPERS.

Upon Tablets 9 to 15 are semi-lunar flint implements.

Nos. 10 to 14 are polished at the straight edge from the friction of some soft substance, such friction as would arise

from pulling the skin of an animal backwards and forwards over the edge; this polishing does not extend over the whole surface of the implements, but only to about three-fourths of an inch from the straight edge; the curved part of the flint was probably inserted in a block of wood, and would thus be guarded from friction. No. 10 shows this polishing very distinctly.

C 26.

Upon Tablets 1 to 3 are other examples of semi-lunar flint implements; of these No. 3 is greatly polished from wear in the way previously mentioned.

In Case C 25, upon Tablet 1, are some semi-lunar flint implements from Sweden.

Upon Tablet 4 is the cast of a semi-lunar flint implement.

FLINT KNIVES AND DAGGERS.

Dr. Lindenschmit admits the difficulty in separating the Scandinavian flint daggers and knives from the flint spear-heads; he, however, points out that the thickness of the handles of many specimens would render it difficult to bind them to a shaft, and that they were probably used, as daggers or knives, in the hand. There is also a difficulty in separating the knives from the daggers, and, indeed, the distinction, if made, must be very arbitrary, depending mainly upon the relative size, with, in the case of some of the flint daggers, certain peculiarities in the handles. Daggers of flint have been classed as belonging to two types:—1st, the broad leaf-shaped; 2nd, those having raised ridges at the handle. These last do not appear to have been found in Great Britain, although they are not uncommon in the North of Germany and Scandinavia. Some flint knives have sharp edges at the sides for some distance from the point, but towards the butt end, the edges have been removed by grinding, apparently with the view of preventing the cutting of the string by which they were attached to the handle, or of rendering them more comfortable for use in the hand.

C 26.

Upon Tablets 5 to 11 are flint spear-heads. Upon Tablets 12 to 16 are flint knives or daggers of the flat leaf-shaped type. Nos. 15 and 16 are fine specimens.

C 27.

Upon Tablet 1 are flint spear-heads. Upon Tablets 2 to 13 are flint daggers; they are chiefly of the flat, leaf-shaped type. Nos. 4, 10, and 11a have had the sharp edges at the sides of the handle removed, so that they might not hurt the hand. No characteristic dagger with raised ridges at the handle is in the Collection. No. 7 is the only moderately good example of this type. No. 13 *has been* a good specimen of this type; it is, however, highly interesting in its present state, for it has been used, broken, and repointed, over and over again, until much of the handle has been chipped away, whilst the blade is reduced to a mere narrow point. The original work can still be traced at the lower part of the handle.

C 25.

SWEDEN.

Tablet 1.—Semi-lunar flint implements from Sweden.

Tablet 2.—Flint daggers from Sweden.

STONE PERIOD OF AMERICA.

THE OBJECTS FROM AMERICA ARE EXHIBITED IN CASES A 40 TO A 52, B 30 TO B 34, C 28 TO C 39, D 19, E 6 TO E 13, AND H 11 TO H 14.

SOUTH AMERICA.

The South American series proper is small, but with it are classed some ancient Carib objects from the islands of St. Domingo and Barbados. Among these are some extremely interesting specimens.

CENTRAL AMERICA.

The Stone series from Central America is not very large. It contains several nearly unique specimens from Honduras, and some objects from Nicaragua. There is also a good series from Chiriqui, Veraguas.

NORTH AMERICA.

The Blackmore Collection illustrates rather fully the Stone period of those tribes who, at various times, have occupied the central district of North America, east of the Rocky Mountains. The specimens, however, are chiefly derived from that portion of this central district which lies eastward from the Mississippi river, between it and the Atlantic coast. Many of the objects are already known to archæologists from the description given of them by Messrs. Squier and Davis.

The Stone series exhibited from the district west of the Rocky Mountains includes some interesting specimens from the neighbourhood of San Francisco, California. The Mexican Stone series is small. It is, however, sufficiently large to serve for the purpose of comparison, whilst the magnificent Collection of Mexican antiquities in the Christy Museum is accessible to those who desire to study this interesting branch of American archæology more in detail.

STONE PERIOD OF THE WEST INDIES.

IMPLEMENTS OF STONE AND SHELL FROM THE WEST INDIES.

CASES A 40, A 41, C 28, C 31, AND H 11.

The implements made by the ancient Caribs differ in some respects from those made by other Stone-age races. Although the workmanship is frequently coarse, and the design is rude and grotesque, yet the stone implements of the ancient Caribs show immense variety in form and a considerable attempt at ornamentation, whilst the patience and the skill evinced in working very hard stones into elaborate shapes is remarkable.

ST. DOMINGO.

All the objects exhibited from this island were collected by the late Sir Robert Schomburgk.

A 40.

The specimens in this Case, Nos. 1 and 2, 5 to 7, and 9 to 12 are from St. Domingo. Nos. 1 and 2 are stone hatchets of

simple form. Nos. 4 and 9 are stone hatchets ornamented with a ridge near the butt-end of the implement; this may have had reference to the mode of hafting. No. 7 is a stone hatchet with wing-like projections at the butt end; these may have assisted in securing the implement to its handle. No. 6 is a stone axe having indentations at the sides, but without a continuous groove carried round the implement. No. 10 is a stone club of dagger-like form, ornamented at the end with the sculptured representation of a squatting human figure. This weapon is sixteen inches in length. Nos. 11 and 12 are stone hatchets with an incised ornament upon one side, representing the upper portion of the human figure. It will be observed that the carving in No. 11 has been effected by "pecking;" in No. 12 the tool marks have been removed by subsequent polishing.

C 28.

All the objects in this Case were found in St. Domingo. Nos. 1 to 10 are stone pestles, used for pounding maize. Many of these specimens are ornamented with carving; such as No. 6, No. 8, and No. 10.

No. 11 is a mealing stone. No. 12 is a stone bowl with sculptured ornament upon the outside; it is five inches and a half in diameter, and may have been used as a mortar in which to bruise grain. No. 13 is a rude representation of the human face; it probably formed part of a stone mortar, or of a mealing stone.

H 11.

Nos. 5 to 11 were found in St. Domingo. Nos. 5 to 7 are varieties of stone tables, standing on four legs, and used in bruising grain. No. 5 is of the most simple form; it is eight inches and a half long, six inches and a quarter broad, and stands four inches and a quarter high.

No. 11 is a sculptured human head; it probably formed part of a stone table similar in form to No. 7. No. 8 and No. 9 are stone pestles similar to those in Case C 28. No. 12 is a modern stone pestle used for bruising grain by the natives of Marquesas; No. 14 is a similar specimen.

Ancient stone pestles of simple form are shown in Case H 13, Nos. 1 to 10 from Ohio, No. 11 from Virginia, Nos. 12 and 13 from New Jersey, and No. 14 from Florida.

No. 13 is a modern stone pestle, from the north-west coast of America, used for pounding meat; it has been presented to the Collection by Sir Edward Poore, Bart.

No. 8 is a sculptured stone collar. It is of an oval form, measuring ten inches and a half in its lesser, and fifteen inches and three quarters in its greater diameter.

An elliptical stone collar was exhibited to the Society of Antiquaries, January 21, 1869, by Mr. Josiah Cato, who made the following observations upon these objects:—

“The ancient stone ring which I have the honour of exhibiting to the Society of Antiquaries this evening is an object of extreme rarity in English collections, and of quite unknown use. It was brought to this country in December, 1865, by my friend, Mr. E. B. Webb, of 34, Great George Street, from the island of Porto Rico, where it was found.

“It is formed from a boulder of light-coloured volcanic stone, is seventeen inches and a half in its greater, and fourteen inches and a quarter in its lesser diameter. The elliptical perforation has a major axis of twelve inches and one-eighth, and a minor axis of eight inches and a quarter. The weight is twenty-five and a half pounds (avoirdupois).

“Externally, the ring has two distinct ornaments; one, at the end of the ellipse and the thickest part of the ring, is *chevronnée*, with nine incised chevronels. The other, on the side of the ellipse, may perhaps be intended to represent the ends of a hoop which have been laid together and bound by a ligature. This second ornament appears on other specimens found in the same island, but the chevronels are replaced by other designs. I am not aware that the human figure is in any case represented.

“The example before the society was exhumed from a considerable depth from the surface, near the top, but on the southern side of the *sierra*, or range of hills, which runs from east to west nearly throughout the length of the island. It is supposed to be the only specimen from this southern slope, but Mr. Webb saw several which had been found on the northern, anciently the more populous, side of the island. They included about five entire rings, and fragments of about as many others. They were all in the possession of one person, who would not part with them, and were all which were then known to have been found in the island; but Mr. Franks has kindly pointed out to me that a similar ring is engraved in the ‘*Mémoires de la Société Royale des Antiquaires du Nord*,’ in a report by C. C.

Rafn on the 'Cabinet d'Antiquités Américaines à Copenhague, 1858,' and that it is said to be from the island of Porto Rico.

"A similar ring, but of lighter proportions and more finished workmanship, is in the magnificent collection formed by the late Mr. Christy. It is from the island of St. Thomas, and may have been obtained by Mr. Christy, in exchange, from the Copenhagen Museum. Its internal diameters are thirteen, and eight and a half inches.

"The only other specimen known to be in this country belonged to the late Sir Robert Schomburgk. It was sold on 1st December, 1865, by auction at Stevens's, and is now in the museum formed by Mr. Blackmore, at Salisbury. Its internal diameters are twelve and a half, and eight and a quarter inches.

"Dr. Wilson, in his 'Prehistoric Annals of Scotland' (vol. i., p. 222), engraves two stone collars, which are somewhat like the specimens in the Blackmore and Christy Collections, and are said to have been found near the parallel roads of Glen-Roy. Judging only from the engraving, they are, however, very much more likely to have come from the Caribbean islands.

"With regard to the probable use or purpose of these rings I can give no information, but shall be very much obliged for any suggestion, or for hints as to any works, likely to contain such an account of the customs of the nations at the time of the Spanish invasion, as may afford a clue to the mystery.

"Such elaborate pieces of work in hard stone could not have been intended to serve either a temporary or a trifling purpose. They are all far too heavy for ordinary use, but yet not heavy enough to kill, or even to greatly torture the wearer, if we regard them as collars of punishment.

"Of the many suggestions I have yet received none seem applicable alike to each of the known examples, and I can only hope that my exhibition to-night may result in clearing all doubt on the subject."

C 31.

The objects in this Case were all found in St. Domingo. Nos. 1, 2, and 4 may have been used as anchors. No. 4 shows considerable wear near the drilled hole as if from its having been suspended with a cord. No. 3 is a stone which has been used for pounding maize. Similar specimens are shown from California, Case H 12, Nos. 6 to 9, and from the United States, Case C 33, Nos. 1 to 4.

BARBADOS.

The specimens exhibited from Barbados have been presented to the Collection by the Rev. Greville J. Chester, who has kindly furnished the following information respecting them:—"In Barbados there is no hard stone, nothing harder than coralline limestone; the aborigines therefore were obliged to import *hard* stone implements and weapons from the other islands, or from the main continent of South America. For ordinary purposes, however, they used implements made of various kinds of marine shells, and of the *fossil* shells from the limestone. These shell implements vary in length from one and a half to six and a half inches; some in my possession are beautifully formed. In the commonest type the natural curve of the shell formed the handle. Discs and beads made of shell, and large quantities of pottery, in a fragmentary state, have been found associated with the shell implements. The large number of implements discovered under rock-shelters, and in gullies, proves the existence of a large native population in Barbados, and as shell hatchets are not found in the other West Indian Islands, it is clear that they are of purely local origin.

A 41.

The specimens Nos. 1 to 19 in this Case were found in various parts of the island of Barbados. Nos. 3, 5, 6, 12 and 18 are pieces of shell, probably intended to be made into implements. Nos. 1, 2, 4, 5, 7 to 11, 14 and 17, are shell hatchets. Nos. 1, 2, 8, 9, 10 and 14 are hollow on one side, and have a gouge-like appearance. The hollow, however, is natural, and in no case has it been extended, by artificial rubbing, to the cutting edge.

Nos. 4 and 17 differ from the other shell hatchets in being nearly equally broad throughout their length; all the others taper away from the cutting end of the implement. No. 4 has the natural hollow of the shell on the under surface. No. 17 is flat on the under surface. The edge of No. 8 is much blunted from use. No. 1 was found on the Codrington estate, parish of St. John (Barbados), in 1868; No. 2 was found near Codrington College in 1867; No. 4 was found below Mount Ararat (Barbados), parish of St. Michael; No. 7 was found in the parish of St. Andrew; Nos. 8 to 11, in the parish of St. Luke; No. 14 was found at Conset Point (Barbados); No. 17, in the parish of St. James.

Nos. 1 and 2, Case A 54, are modern shell hatchets, from Melanesia. The natural form of the shell determined the shape of No. 1, as with the Barbados implements. Nos. 2 and 9, Case E 2, are mounted shell adzes, from Melanesia. No. 21, Case C 40, is a mounted shell adze, from the Society Islands.

These specimens show that the use of shell for implements was not limited to the ancient Caribs of Barbados.

Nos. 13, 15, and 19 are specimens of the pottery found in Barbados, associated with the shell implements. No. 13 was found in the Chapelry of St. Luke, and No. 15 at Conset Point. Nos. 13 and 15 are portions of the rims of rather large vessels; they have an indented ornament upon them, produced by removing a portion of the clay, whilst still in a plastic state, with the point of the thumb; the mark of the thumb-nail is very distinct. A similar kind of ornament may be seen upon the pottery No. 5, D 12, from the Highfield pit-dwellings, near Salisbury. No. 16 is a polished hatchet of greenstone, found in the parish of St. James (Barbados).

A 41.

ST. VINCENT.

No. 20 is a polished hatchet of greenstone, found in Buccament Valley, Island of St. Vincent; it has been presented to the Collection by the Rev. Greville J. Chester.

A 40.

JAMAICA.

Dr. Wilson mentions that the island of Jamaica has furnished a peculiarly abundant series of examples of the stone and flint weapons and implements of its ancient inhabitants. The only specimens from Jamaica, in the Collection, are Nos. 3, 13, and 14. No. 3 was found at Richmond Hill, in the parish of St. James. It was presented by the late Mr. G. Witt, F.R.S. Nos. 13 and 14 were given by Mr. Newell V. Squarey.

A 40.

WEST INDIES.

No. 8 is a stone implement, perhaps used as a club; it has two deep grooves on one side, and marks of wear above the grooves; a drilled hole has been commenced on the under surface.

SOUTH AMERICA.

STONE IMPLEMENTS, POTTERY, &c., FROM SOUTH AMERICA.
CASES A 52, E 10 TO E 13.

ECUADOR.

A 52.

Nos. 3, 7, and 8 are stone implements from Ecuador. No. 3 is of simple wedge-shaped form. (Paris Exhibition, 1867.) A stone hatchet of similar type can be seen in Case E 2, No. 20, in its original wooden handle. This specimen is from British Guiana, and was presented to the Collection by Mr. W. Morrison, M.P.

No. 8 has two lateral projections at the butt-end; probably these were of use in attaching the implement to the handle. Varieties of this type are abundant in South America, although they are frequently of smaller size than No. 8.

No. 7 is a dentated stone implement, with a drilled central hole; it was found in Ecuador, and was perhaps intended for arming a club. Tablet 5 *a* is an obsidian flake, and *b* is an obsidian arrow-head, both found near Guayaquil, Ecuador. (Paris Exhibition, 1867.)

A 52.

Upon Tablet 4 are some terra-cotta beads with incised ornaments, found in a *tola* near the village of Naranjal, Ecuador. (Paris Exhibition, 1867.) Upon Tablet 6 is an obsidian flake, a terra-cotta bead, and some copper ornaments found in some Indian graves, near Naranjal. (Paris Exhibition, 1867.)

POTTERY FROM ECUADOR.

E 12.

The pottery shown from Ecuador was found at Porto-Viejo. After floods the banks of the river founder, and pottery and other antiquities are met with in the detritus. All the specimens from Ecuador were obtained from the Paris Exhibition, 1867.

No. 1.—Small figure of brown ware, in the form of a bird

pierced with several holes. The hole at the back of the figure may have served for suspension.

No. 2.—Fragment of fine black ware, in the form of a woman's head, with a curious cap, similar to that upon the heads of figures Nos. 6 and 7. The ears and nose are pierced to receive ornaments; the present rings in them are probably modern additions; the nose is very aquiline.

No. 3.—Small figure of brown ware, in the form of a bird, pierced with holes and ornamented with incised lines and dots.

Nos. 6 and 7.—Fragments of vessels of light-coloured brown ware, in the form of women's heads.

No. 8.—Figure of a toad, in brown ware (probably modern).

Nos. 10 and 13.—Fragments of vessels of brown ware, representing heads of Indians. No. 7 wears a nose ornament. The noses of both figures are very aquiline.

Nos. 11 and 12.—Figures of Indians, in brown ware.

No. 15.—Vessel of coarse red ware, with handle.

No. 16.—Grotesque figure, of black ware.

No. 17.—Flat piece of red ware, pierced for suspension; upon one surface is the representation of two human figures.

No. 18.—Figure of a frog, or toad, in coarse black ware.

No. 19.—Whistle of brown ware, in the form of an Indian; the ears are pierced.

No. 20.—Vessel of brown ware with handle: the spout has been painted red, beneath which are traces of a collar of black, white, and red ornament in lines and dots.

No. 21.—Figure of an Indian, in red ware, having a curious head-dress, and decorated with incised lines.

No. 22.—Bowl of red ware, the upper part painted white. This vessel has been used by the Ticunes in the preparation, or at least for the reception, of wourali poison, a lump of which is inside the bowl; a quantity remains attached to the lip of the vessel.

Nos. 23 and 24.—Drawings of the plant, &c., used in the preparation of wourali poison. They were presented to the Collection by M. Ed. Durassié.

Wourali, woorali, curari, or urari, is a very active poison prepared by several tribes, in South America, who, as far as possible, keep the manufacture a secret. The most deadly wourali is prepared by the Ticunes; the basis of the poison is the juice of a climbing plant, *Strychnos toxifera*, a drawing of which, No. 23, is exhibited.

No. 25.—Quiver of arrows, or darts, poisoned with wourali. The quiver is made of strips of bamboo plaited, coated with wax, and then covered with a piece of the hide of a tapir or peccari.

In shape the quiver resembles a dice-box. Round the middle there is fastened a loop large enough to admit the arm and shoulder, from which it hangs when used. To the rim is tied a little bunch of silk grass, and half of the jaw-bone of the fish called "pirai," with which the Indian scrapes the point of his arrow. Before the arrows are put into the quiver they are linked together by two strings of cotton, one string at each end, and are then folded round a stick, which is nearly the length of the quiver. These arrows are used with a blow-tube, through which, by a sudden expiration of the breath, they can be projected about 100 yards with great accuracy of aim. They are certain death to any animal struck.

TROPHY. R 8.

No. 1 is a blow-tube from British Guiana, used for shooting poisoned arrows; this blow-tube is covered with plaited bamboo.

BRAZIL.

A 52.

No. 9 (S and D 528) is a plummet-like stone object, from Brazil; it formed part of the Squier and Davis Collection, and Dr. Davis suggests, in a manuscript catalogue sent with the specimens, that it has been used as a net-sinker. It appears highly improbable that an object so highly finished as No. 9 should have been used as a net-sinker.

Similar stone plummets may be seen in Case A 48, Nos. 21 and 22, from Ohio. In Case D 19, upon Tablet 10, are other plummets of shell, from a shell-mound in Florida.

PERU.

A 52.

Nos. 10 to 19 are various objects from Peru, most of which are of no great antiquity. No. 10 (S and D 37) is a spindle with the stone spindle-whorl still attached to it, and having some of the spun alpaca wool around the stick. No. 11 (S and D 38) is a stone spindle-whorl (?). Nos. 10 and 11 were found in graves, in Peru. No. 12 (S and D 571) is described

by Dr. Davis as "an amulet, with a hole through one end for suspension, and a cavity in the other for holding feathers; there is a signet at the side."

Tablet 13, *a* (S and D 35) is a "reed or tube, used perhaps for sucking 'Matta' tea;" *b* (S and D 34) is "a piece of the Pito, a species of aloe. This spongy wood is the 'Pao de Fogo' (tinder-wood) of the natives"; *c* (S and D 36) is described as "a flat piece of wood with a hole through the centre, the use not known;" may it not have been used as an ornament? in form it closely resembles some of the stone "gorgets;" *d* (S and D 33) "a piece of wood much decayed, use not determined;" this may have been a fire-drill; it is like the Esquimaux fire-drills, Nos. 39 and 40, Case C 42, and No. 13 *c*, Case D 5, which last was found in a grave in Greenland.

Upon Tablet 14 (S and D 30) are some grains of maize, and upon Tablet 15 is part of the cob with grains of maize attached. They were found in a grave, placed in a very nicely plaited basket, which is in the Collection, but cannot be shown from want of space. Upon Tablet 14 *b* (S and D 31) are some beans, also found in the basket, as well as the flat bone beads (S and D 32) upon Tablet 16; a thread of twisted alpaca wool still remains in the central hole of some of these beads. In Case D 7, upon Tablets 1 to 10, and 12, are similar beads, made of shell, used for decorative purposes by the natives of Salomon Islands. No. 17 (S and D 567) is a stone amulet(?), nicely ornamented. No. 18 (S and D 572) is "an ornament of hard slate, cut into the shape of a fish-hook." Fish-hooks of this form, from the Sandwich Islands, can be seen in Case D 6, upon Tablets 18 and 19.

CASES E 10, E 11, AND H 19.

POTTERY FROM PERU.

E 10.

Many of the vessels exhibited from Peru are "huacas," and were intended to hold "chicha," a drink made from maize. They were frequently deposited with the dead.

Some of the Peruvian vessels are double, in this respect repeating with considerable similarity the *bijugué*, or twin-bottle, of the ancient Egyptians; others have double spouts, which also constitute a characteristic feature of the water-pitcher, called the "monkey," still in universal use in Brazil. A few are of simple and graceful forms, and others are modelled from

melons, gourds, and other fruit. These are occasionally found with a grotesque animal head added as the mouth of the vessel. Among the animal figures which have been observed in Peruvian pottery are the duck, parrot, pelican, turkey, land-turtle, monkey, lynx, otter, llama, toad, cayman, shark, &c.

The greater part of the sacred vessels buried with the mallquis, and destined to receive the chicha of sacrifice on feast-days, have an enlarged neck, placed ordinarily near the handle, with a hole to pour out the liquid, and an opposite opening through which the air escapes whilst the vessel is being filled. Many are double; others are quadruple or sextuple, or even octuple; that is, the principal vessel is surrounded with regular appendages, which communicate among themselves and with the principal vessel. It is said that some of the double vessels, whilst they are being filled with fluid, emit sounds from the air-holes which imitate the voice of the animal represented by the principal part of the vessel. In making this experiment it is highly desirable that the listener should be possessed of a lively imagination.

No. 1. Vessel of brown ware, ornamented with colour in lines and crosses. The lower part of the vessel is in the form of a human head, with ornaments (labrets) in the lips, and similar ornaments in the ears; the nose is extremely aquiline. It was presented to the Collection by the late Admiral Sir William Bowles, K.C.B.

No. 2 (S and D 61). Vessel of fine red ware, in the form of a man, seated, with his arms crossed and tied behind his back.

This prisoner has a cord round his neck, with a loose end hanging down his back, probably for leading him. The features of the figure are quite unlike those of No. 1.

No. 3 (S and D 62). A similar vessel to No. 2, but the ware is not so fine, and the modelling is not so carefully executed. It is in the form of a woman, seated; round pendants hang from her pierced ears; the features of the figure resemble those of No. 2. The vessel has been ornamented with white paint.

No. 4 (S and D 83). A frog or toad of black ware. It formed part of some vessel.

No. 5 (S and D 71). Rattle of black ware, the upper part in the form of a human head, wearing a cap with two conical projections at the corners. A similar form of cap can be seen on the figure, No. 22.

No. 6 (S and D 566). Small figure of a bird in red ware; a hole passes through the head in the position of the eyes.

No. 7 (S and D 60). Double vessel of black ware. This is

one of the whistling jugs. One of the bottles is in the form of a man, wearing a conical cap; ornaments are in the ears; a cord is passed round his neck, and a second cord is round his waist; he appears to be asleep, with his head falling on one side, but he is prevented from slipping farther by the cord. Dr. Davis is of opinion that "the man is evidently under the influence of chicha."

No. 8 (S and D 56). Vessel of black ware, in the form of the fruit of the "chirimoya."

No. 9 (S and D 55). Vessel of red ware, with a handle, in the form of a squash.

No. 10 (S and D 48). Vessel of fine black ware, with handle, ornamented with human figures and human heads. The face of the central head is decorated with lines, perhaps intended to represent tattooing. This vessel stands upon a regular ring carried round the base.

No. 11 (S and D). Vessel of red ware, coarsely painted with red, black, and white lines and figures, having two ears at the sides, which are pierced for suspension.

No. 12 (S and D 45). Vessel of red ware, coarsely painted with red and black lines, having two handles at the sides.

No. 13. Small vessel of brown ware, in the form of a puma. It was obtained from the ruins of Truxillo, by Mr. G. Miller, purser, H.M.S. Tartar, and was formerly in the United Service Museum. The head of the animal upon the vessel No. 4, Case E 11, shows a similar conventional treatment.

No. 14 (S and D 54). Water-dipper (?) of red ware. The handle terminates with the figure of a human head, wearing a singular head-dress, fastened beneath the chin by a band, and falling in folds at the back of the head. The head-dress is decorated with red. The handle and the under side of the vessel are painted white. Two eagles, feeding, are painted in red upon the back of the vessel.

No. 15. Double vessel, of black ware—a whistling jug. One of the bottles has the top in the form of a bird's head. By blowing through the tube upon the top of the other bottle a whistle is produced; the note can be varied by closing some of the holes in the bird's head.

No. 16 (S and D 70). Small figure of coarse ware, with holes at the sides for suspension. Found at Truxillo.

No. 17 (S and D 59). Vessel of coarse red ware, in the form of a sitting monkey; a cord is passed round the neck and middle, as with the human figure No. 2.

No. 18. Vessel of black ware, the spout gone, in the form of a woman's head, with the hair elaborately braided and dressed. A circular ornament is in the right ear. This specimen was formerly in the United Service Museum.

No. 19. Vessel of black ware, formerly in the United Service Museum.

No. 20. Vessel of brown ware, in the form of a human figure, with necklace and braided hair. This specimen was presented to the Collection by the late Admiral Sir William Bowles, K.C.B.

No. 21 (S and D 47). A bottle or jug of black ware, furnished with what serves for both handle and spout, a peculiarity frequently met with in Peruvian pottery. Two rude figures of birds ornament this vessel.

No. 22 (S and D 53). Vessel of black ware, with a handle having a tube (spout) at one end, and the representation of a human head at the other. The figure wears a cap, with conical projections, like that upon rattle No. 5.

No. 23 (S and D 63). Cast of a vessel, in the form of a man's head, wearing a helmet. The nose is very aquiline. This is a remarkable specimen of Peruvian art, and is highly interesting as illustrating the Peruvian type of countenance and the peculiarity of head-dress. The original is of red ware, ornamented with white, and is in the Collection of the American Ethnological Society.

E 11.

No. 1 (S and D 51). Vessel of red ware, having a handle with a tube (spout) at one end, and the figure of a bird, probably a toucan, at the other. The figures of two animals encircle the body of the vase. It is a whistling jug; the whole surface has been painted white, relieved with red lines. It stands upon a ring which is carried round the base, like No. 7.

No. 2 (S and D 57). Vessel of black ware, with a handle, in the form of a fish.

No. 3. Vessel of red ware, painted with black figures and lines.

No. 4 (S and D 58). Oblong vessel of black ware, the upper part in the form of a puma, suckling four young ones. The head of the puma has the same conventional treatment as that of No. 13, Case E 10. The potter in each instance has represented a condition of extreme leanness; the backbone and the ribs appear to be coming through the skin.

No. 5. Huacha of red ware, ornamented with lines and figures in white, red, and black. At the sides are two handles, and under the spout are two ears, with holes for suspension. The bottom of this vessel ends in a point; it could not have stood without some kind of support; it was presented to the Collection by the late Mr. Lingard.

No. 6. Double vessel of black ware—a whistling jug; one bottle is in the form of a bird. It was formerly in the United Service Museum.

No. 7 (S and D 52). Vessel of fine black ware, in the form of a bird, very nicely modelled. This vessel has a ring at the base to render it firm in standing.

No. 8 (S and D 50). Vessel of red ware, ornamented with incised lines and streaks of black paint. Upon the handle there are four frogs, which have been painted black. This vessel has a ring at the base, as with No. 7.

No. 9 (S and D 46). Vessel of black ware, ornamented with lines and bosses, and having two ears at the sides, pierced for suspension.

H 19.

No. 10 (S and D 49). Vessel of black ware, with double spout connected by the handle. The body of the vessel is melon-shaped.

No. 11. Vessel of black ware, formerly in the United Service Museum.

POTTERY FROM BOLIVIA.

E 13.

No. 1. Vessel of red ware, in the form of a seated human figure, with an animal slung over each shoulder. This vessel is painted white, and is ornamented with red lines. (Paris Exhibition, 1867.)

POTTERY FROM URUGUAY.

E 13.

No. 2. Fragment of pottery, with impressed ornament, found

at Salto, Uruguay. This specimen was presented to the Collection by M. Ed. Durassié. (Paris Exhibition, 1867.)

POTTERY FROM NEW GRANADA.

E 13.

No. 3. Vessel of brown ware, with two spouts, connected by a handle, and ornamented with lines scratched after it had been fired. (Paris Exhibition, 1867.)

POTTERY FROM BRITISH GUIANA.

E 13.

Nos. 4 and 5. Rude terra-cotta figures of a man and a woman, made by the Macoushi Indians, British Guiana. (H. C. Whitlock's Collection, Exhibition, 1862.)

No. 6. Bowl of brown ware, made by the Caribisi Indians, river Essequibo, British Guiana. The vessel is glazed in the inside only, and is ornamented with red lines, chiefly, and more carefully, upon the inside. (George Dennis' Collection, Christy Museum.)

A 52.

No. 20 is a stone hatchet said to have come from South America. It was presented to the Collection by Mr. Jones.

CENTRAL AMERICA.

THE OBJECTS FROM CENTRAL AMERICA ARE EXHIBITED IN
CASES A 41, C 33, C 43, AND E 8.

CHIRIQUI.

An interesting series of objects is shown from some ancient Indian graves, at Chiriqui, in Veraguas, south-west of Panama, on the Isthmus of Darien.

In the autumn of 1858, two Spanish Creole farmers of Chiriqui, named Ignacio Guerra and Victorio Pitti, while harvesting a crop of corn, accidentally discovered a golden image, which had been exposed by the uprooting of a plant. They

cautiously and secretly made farther search, and were successful in obtaining other specimens. They proceeded to make excavations, not continuously, but as circumstances permitted, until the 1st May, 1859, when their concealed operations became known to the inhabitants of the neighbourhood. The report of the discovery of treasure soon attracted numbers of diggers, and, by the middle of May, more than a thousand persons were engaged in ransacking the graves of this huacal, or ancient place of burial, which is situated in the district of Boqueron, parish of Bugaba, about 25 miles from David, and 15 miles only from the sea, in a direct line.

The original discoverers have admitted that, prior to this influx of treasure-seekers, they had collected about 130 pounds weight of golden figures, many of which were alloyed with copper.

Dr. J. King Merritt spent several weeks, in the summer of 1859, in examining the then newly-discovered burial-grounds of Chiriqui.

Two forms of graves (huacas) were observed—circular or oval, and rectangular. The oval graves were from four and a half to six feet deep, and from three to four feet in their greatest diameter. A wall of rounded river stones, two and a half feet high, was built as a lining round the grave at the bottom. From the top of this wall to the surface the grave was filled with river pebbles. The gold ornaments, pottery, and other antiquities were chiefly found in the walled space beneath the deposit of pebbles. The circular and oval graves yielded the most figures of gold, and the finest specimens of pottery. The gold figures were sometimes inserted in the crevices of the wall, but in no instance had they been placed in the earthen vessels found associated with them. No human remains were met with in the oval huacas; but a layer of black loam was interposed between the relics and the pebble deposit.

The quadrangular huacas were, in some instances, constructed in the same manner as the oval graves; there was the same wall of rounded pebbles, above which the entire space was filled with pebbles. The quadrangular graves of this description were larger, and yielded more relics, than the other quadrangular graves. They were freely interspersed with the oval graves in the northern and western parts of the huacal, but were more numerous in the southern portion of it. Some of these huacas measured nearly six feet deep, seven feet long, and four and a half feet broad. The relics were found usually

near the bottom, at the northern and southern extremities, and more or less on the eastern side. The gold figures were generally in the central line, and at about one-fourth of the distance from the head to the foot of the grave. Earthen vessels were sometimes found in the pebble deposit, near the surface, and if so, they were usually at either the head or the foot of the grave-space.

The other variety of quadrangular huaca, although poor in relics, was more carefully and differently constructed. This variety existed chiefly in the southern and eastern sections of the huacal. A hole had been dug, six feet six inches long and four feet broad; at the depth of three feet, this space was contracted eight or ten inches on all sides, and was sunk to the additional depth of about two feet. This smaller excavation, or cist, was lined at the sides with flat stones placed edgewise, which were held in position by larger flat stones resting upon them, and the earthen ledge at the top of the cist. The floor of the cist was not paved; there were usually two depressions in it, corresponding with the probable position of the head and the heels of the body. The cist was covered with flat stones, and the space between the cover and the surface of the ground was filled with pebbles. The relics in these huacas were chiefly found at the head and foot, and on the eastern side. Scarcely any, if any, gold figures were found in this variety of huaca; pottery was found in the cist, and, sometimes, in the pebble deposit. A black loamy earth in the cist indicated the original position of the body.

Mr. John F. Bateman, of Panama, says of the Chiriqui graves that they are all regularly built sepulchres, the body having been laid upon the "hard pan" or clay; the sides were formed of flat stones, and the cover was of larger flat stones, many of which would measure a yard square. The graves varied in depth, ranging from three to ten feet; the distance of the "hard pan" from the surface regulated the depth, for the body was always placed upon it. The bodies were deposited lying north and south. Some of the graves contained as much as 3lbs. weight of gold objects, others none. The richest graves had the least pottery, and the huacas without gold the most pottery. Stone hatchets were also found associated with the gold objects and the pottery.

Most of the gold ornaments taken from the huacas were, probably, worn as ornaments, suspended around the neck of the person buried. Square, oblong, triangular, and circular plates of thin fine gold have also been met with. Nearly all the

golden figures are alloyed with copper. Some of the most pure are $21\frac{3}{8}$, and the least pure are not more than $11\frac{7}{8}$ carats fine. The thin gold plates are about $21\frac{1}{8}$ carats fine.


The alloy of which the figures have been formed was prepared artificially, and is not native; the objects have been cast, and some have been finished by hammering.

STONE IMPLEMENTS, GOLD FIGURES, AND POTTERY FROM THE
CHIRIQUI HUACAS ARE SHOWN IN CASES A 41, C 32, E 8,
H 19, AND H 21.

E 8.

The pottery found in the Chiriqui graves is very far in advance of that made by the Northern Indians. Many of the vessels are tripods, and these, frequently, have movable clay pellets in the hollow legs, which produce a rattling sound.

A number of musical instruments have been obtained from the Chiriqui graves; they are made of pottery, and are usually in the form of birds or animals. They range from one inch and a half to four inches and a half in length. The more perfect instruments have three finger-holes, to produce the first

three notes of the major scale of F—F, G, A, 

They are usually painted in red and black on a cream-coloured ground.

No. 1 (S and D 28).—Small globular vessel with lip, of brown ware, painted red and relieved with black lines.

No. 2 (S and D 44).—Small gourd-shaped vessel of brown ware, covered with a thick coating of white paint. Dr. Davis suggests that this object has been used as a lamp.

No. 3 (S and D 78).—Cast of a musical instrument (whistle) in the form of some quadruped. The original is in the Collection of the American Ethnological Society. It is painted red and black on a cream-coloured ground, and measures nearly five inches in length. The whistle is at the tail of the animal.

No. 4 (S and D 77).—Cast of a whistle in the form of a bird, the whistle being at the tail. This object is similar in material and colouring to No. 3. The original is in the Collection of the American Ethnological Society.

No. 5 (S and D 75). Painted whistle in the form of an animal, of similar ware to Nos. 3 and 4. The whistle is in one of the fore legs. The note can be varied by closing some of the holes in the head and body of the animal-figure.

No. 6 (S and D 74).—Whistle ornamented with rude figures of animals. It may be remarked that the whistles Nos. 5 and 6 are coincident in pitch, the extreme sounds (from F to A) forming the interval of a major third.

No. 7 (S and D 43).—Small painted double vessel, with handle, of similar ware to No. 5.

No. 8 (S and D 35).—Small painted vessel, standing upon three solid legs, of similar ware to No. 5.

No. 9 (S and D 76).—Small painted figure of an Indian, in a sitting posture, the ware similar to No. 5. This figure is pierced with nine holes.

No. 10 (S and D 73).—Whistle of brown ware, in the form of a bird, the whistle is at the tail. This whistle has all the characteristics of Nos. 5 and 6, but it is a major second higher in pitch. As these objects must have altered considerably in burning, great practical skill is shown in their manufacture, for, from the condition of the holes, it is evident that they were not tuned after being fired.

No. 11 (S and D 36).—Small vessel of brown ware, standing on three solid legs; it is ornamented with red paint, incised lines, and rude figures.

No. 12 (S and D 27).—Globular vessel of brown ware, with a lip and two ears at the side.

No. 13 (S and D 29).—Globular vessel with two handles; ornamented with red paint.

No. 14 (S and D 40).—Vessel in the form of an animal, standing on three solid legs, and ornamented with red and black paint.

No. 15 (S and D 27).—Globular vessel with two ears; the ears represent squatting human figures.

No. 16.—Globular vessel, ornamented with red and black paint.

No. 17.—Leg of a vase, in the form of a fish; it is hollow, and has a loose ball of clay inside to serve as a rattle.

No. 18.—Ornament of a vase; the under part shows that these clay ornaments were modelled apart from the vessel, and were then attached to it.

No. 19.—Globular vessel, with two ears in the form of human figures. This vessel is decorated with red paint.

Nos. 20 and 21.—Small globular vessels, without ears; they are decorated with red and black paint.

Nos. 16 to 21 were presented to the Collection by Captain Oliver Eldridge, of San Francisco.

No. 22 (S and D 33), No. 23 (S and D 32), No. 24 (S and D 34).—Three vessels of unpainted ware; they each stand upon three hollow legs, in which are loose clay pellets. These vessels are ornamented with grotesque heads of owls, &c.

No. 25 (S and D 26).—Globular vessel, with two ears in the form of animals. These ears are hollow, and have clay balls inside, which rattle.

No. 26 (S and D 38).—Globular vessel, with two ears, supported on three hollow legs, in the form of alligators ornamented with bosses, and having clay pellets inside them.

No. 27 (S and D 25).—Globular vessel of unpainted ware, with two ears in the form of animals.

No. 28 (S and D 39).—Boat-shaped vessel of fine unpainted ware; it has been ornamented with three figures, one of which only remains, representing the bust of an Indian who is leaning upon his elbows. The vessel appears to have stood upon *two* legs, both of which are gone.

No. 29 (S and D 31).—Jug-shaped vessel with handle, ornamented with red paint.

No. 30 (S and D 37).—Vessel with two twisted ears, standing upon three solid legs, and decorated with red paint in circles and lines.

No. 31.—Globular vessel of unpainted ware, originally with two ears, one of which remains. The vessel stands on three legs.

No. 32.—Globular vessel of unpainted ware, with two ears in the form of animals. This vessel is decorated with incised dots, circles, and lines.

No. 33.—Basin-shaped vessel of unpainted ware; it stands upon three hollow legs, having clay pellets inside them.

Nos. 31 to 33 were presented to the Collection by Captain Oliver Eldridge.

No. 34 (S and D 30).—Fragments of a globular vessel, with ears, of very fine ware. It has been decorated with red, black, and white paint.

H 19.

No. 9 (S and D 42).—Large globular vessel, having two ears, with "key-pattern" border painted in red and black.

H 21.

No. 8 (S and D 41).—Globular vessel of unpainted ware, ornamented with a pattern round the neck.

A 41.

The objects in this Case Nos. 21 to 34 are from the *huacas* of Chiriqui. Nos. 23 and 26 were presented to the Collection by Dr. Otis, Nos. 21 and 33 *a* by Captain Oliver Eldridge.

Nos. 21 to 25 are stone hatchets. No. 26 is part of a spear-head of obsidian. Upon Tablet 27 (S and D 437, 439, 440) are three stone arrow-heads.

Upon Tablet 28 (S and D, U 39) is an electrotpe copy of a gold ornament, representing two human figures, nude, with the exception of a loin-cloth, each bearing a shovel-shaped weapon and a spear; they have ear-ornaments and necklaces, upon their heads are square-shaped head-dresses. The original is in the Collection of the Honourable Caleb Lyon.

Upon Tablet 29 (S and D, U 42) is an electrotpe copy of a gold ornament in the shape of a frog. The original has been melted.

Upon Tablet 30 *a* (S and D, U 41) is an electrotpe copy of a gold ornament in the form of a puma. The original is in the Collection of Dr. Merritt.

b (S and D, U 43) is a gold bell with a ring for suspension.

Upon Tablet 31 (S and D, U 37) is an ornament in the shape of a frog. The gold, of which this object is formed, is much alloyed with copper. There are balls of metal in the eye-cavities which produce a rattling noise. This specimen has evidently been cast; the feet and other parts show that they have been subsequently flattened by hammering. There are holes in the forefeet, by which this ornament could have been attached to the person.

Upon Tablet 32 (S and D, U 38) is an ornament of base gold in the form of a fish, having holes for suspension.

Upon Tablet 33 *a* is a small figure of base gold in the form of a puma.

Upon Tablet 34 (S and D, U 40) is an electrotpe copy of a gold ornament in the form of a human figure, wearing a crown of serpents' heads. The original has been melted.

The other metallic objects in this Case are for comparison.

Upon Tablet 35 *a* to *i* are figures in base gold from New Granada (Paris Exhibition, 1867). Upon Tablet 33 *b* (S and D, U 36) is a piece of sheet gold, which formed part of the wrapping of a mummy, found in Arica, Peru, in excavating for the railroad. Upon Tablet 36 (S and D, U 31) is an ornament, found in Peru, in the form of a fish, made of thin sheet silver; it has been cut with a very blunt tool, for the edges are still ragged. It formed one of many ornaments upon a mantle, trimmed with feathers, now in the Collection of the American Ethnological Society.

C 32.

Nos. 1 and 2 (S and D 565 and 458).—"Metatls" of trachyte, each in the form of a carnivorous animal; from the Chiriqui graves. The upper part of the body is expanded into a flat table, upon which the maize was crushed with a roller or pestle. The tail of the animal has served as a handle. The legs and sides of these objects are covered with sculptured ornament.

No. 3 (S and D 457).—Stone pestle used with the above kind of corn-crusher. It was found with No. 2. No. 4, "Metatl" similar to Nos. 1 and 2; it was presented to the Collection by Captain Oliver Eldridge.

THE OBJECTS FROM NICARAGUA ARE SHOWN IN CASES A 42 AND E 8.

A 42.

Nos. 1 to 4.—Stone hatchets from Nicaragua, presented to the Collection by Mr. F. Boyle, F.R.G.S. No. 1 is of an elegant form, and is made of milky quartz.

POTTERY FROM NICARAGUA.

E 8.

No. 35.—Vessel of black ware with two handles, and with a flat bottom.

No. 36.—Rattle of coarse ware, in the form of a grotesque human figure.

Nos. 37 and 38.—Gourd-shaped vessels of brown ware.

No. 39.—Vessel of brown ware, representing the human face

and figure. This vessel is decorated with red and black paint.

Nos. 40 and 41.—Vessels of black ware, with handle; each in the form of a bird, the beak serving for the spout. They are both flat at the bottom.

SALVADOR.

A 52.

Nos. 1 and 2 are two cores of obsidian, found near San Salvador. (Paris Exhibition, 1867.)

HONDURAS.

C 33.

The specimens Nos. 5 to 7 are three very remarkable flint implements. They were found about the year 1810, with other examples, in a cave between two and three miles from the Bay of Honduras.

These specimens were thought to be unique until the three flint objects in this Case, Nos. 8 to 10, were obtained, in 1868. It is probable, from the resemblance they bear to Nos. 5 to 7, both in material and workmanship, that they also were obtained from Honduras.

GUATEMALA.

A 42.

No. 5 (S and D 568).—Amulet of serpentine in the form of a human head; it is drilled at the back for suspension.

E 8.

No. 42 (S and D 66). Object in the form of a kneeling human figure, of coarse ware, found in Guatemala.

NORTH AMERICA.

MEXICO.

STONE IMPLEMENTS AND OTHER OBJECTS FROM MEXICO ARE
SHOWN IN CASES A 42, C 29, C 30, E 7,
E 9, AND H 11.

A 42.

No. 6 (S and D, 434) and No. 7, Stone hatchets. No. 7 was presented to the Collection by the Trustees of the Christy Museum. No. 8 (S and D, 438), Flint arrow-head. No. 9 (S and D, 564), Greenstone weapon; probably a stick was passed through the drilled hole, and it was used as a club. Somewhat similar drilled stones are used for arming clubs by the natives of the Salomon Islands. No. 14, Grooved stone axe.

C 29.

All the specimens in this case are from Mexico. The objects upon Tablets 1 to 13 were presented to the Collection by the Trustees of the Christy Museum.

Upon Tablets 1 to 7, 9 *b* and *d*, 10, 11, and 14, are obsidian flakes. Such flakes as these were used by the Mexicans for arming wooden spears and swords, and for daggers. Some of their spears and arrows were tipped with copper or bronze, but the greater part of their weapons were armed with flakes of obsidian.

C 29.

Upon Tablets 8, 9 *a* and *c*, are obsidian cores.

Upon Tablets 11 *b*, 12 *b*, *c*, *e*, *f*, *g*, 13 *a* and *b*, are obsidian arrow-heads.

Upon Tablet 12 *d* is an obsidian disc, perhaps intended for use with some form of sling.

C 29.

Upon Tablet 15 are some stone amulets, drilled for suspension.

Upon Tablets 16 and 17 are some amulets and beads of jade, serpentine, and other varieties of hard stone.

C 30.

Nos. 1, 2, 4, 5, 6, and upon Tablet 14 are human and other figures carved in alabaster.

No. 3 is a carving in stone representing an animal's head.

Upon Tablets 7 and 8 are some serpentine and jade beads.

Upon Tablet 9 is part of a polished mirror made from a nodule of iron pyrites. These so-called mirrors were frequently used for decorating the masks made by the Mexicans.

Upon Tablets 10 to 13 are amulets, beads, and ornaments of shell.

The specimens Nos. 1, 2, 4—6, 9, and 14 were presented to the Collection by the Trustees of the Christy Museum

H 11.

No. 1 is a miniature model in wax of the Aztec Goddess of War (or of Death), Teoyaomiqui. The original is carved out of a huge block of basalt, and stands about nine feet high, with a breadth of five feet six inches. Some antiquaries think that the figures on it are intended for different personages, and that it represents three deities—Huitzilopochtli, the god of war, Teoyaomiqui his wife, and Mictlanteuctli, the god of hell.

H 11.

No. 2 is a wax model of the Mexican calendar stone. The original is sculptured upon the face of a single block of basalt, which weighs between twenty and thirty tons. It is built into the base of one of the towers of the Cathedral at Mexico, in the Plaza Mayor, and passes by the name of "el Relox de Montezuma," or "Montezuma's watch." This vast mass of basalt measures eleven feet eight inches in diameter.

H 11.

No. 3 is a wax model, to a reduced scale, of the so-called "sacrificial stone." The original is a cylindrical block of basalt, nine feet in diameter, and three feet in height, which now stands in the courtyard of the Museum at Mexico. It was found, in 1790, buried beneath the surface, in the great square, and when first discovered was overturned.

NEW MEXICO.

A 42.

No. 10 (S and D 473). A stone ball from Casa Blanca

No. 11 (S and D 570). Fragment of a stone amulet.

No. 12 (S and D 569). Small stone amulet in the form of a bear; such amulets are still worn by the Pimo Indians.

No. 13 (S and D 19). Bone awl made from the fibula of a deer; it was found in the river Gila.

CASES E 7 & H 20.

POTTERY FROM MEXICO.

E 7.

No. 1 (S and D 23). Vessel of brown ware, in the form of a puma, ornamented with incised lines; beneath the throat is a cavity in which there is a loose clay ball to serve as a rattle.

This specimen was excavated from the ruins of Palenque, in 1760.

No. 2.—Fragment of a terra-cotta figure representing a seated human figure.

No. 3.—Terra-cotta representing a human head.

Upon Tablet 4 *a* is a terra-cotta bead.

Upon Tablet 4 *b* (S and D 69), is a fragment of terra-cotta, representing a human head.

Upon Tablets 14 *a* to *c* are other terra-cotta figures of human heads from Teotihuacan; these, as well as the specimen upon Tablet 4 *b*, apparently represent heads artificially flattened.

Upon Tablet 5 *a* is a fragment of ware.

Upon Tablet 5 *b* and *c* are terra-cotta "spindle-whorls."

Upon Tablet 16 *a* to *k*, are other terra-cotta "spindle-whorls."

Upon Tablet 5 *d* and *e* are terra-cottas representing seated human figures.

No. 6 is part of a flute in terra-cotta.

No. 7. is a terra-cotta whistle, in the form of a monster.

No. 8.—Figure of an animal made of the scented clay of Mexico, brought from Teotihuacan. This specimen and No. 9 are probably modern; they were formerly in the United Service Museum.

No. 9.—Cup made of the scented clay of Mexico.

No. 10 (S and D 65).—Cast of an idol found at Cholula; the original is in the Collection of Dr. Barlow.

No. 11 and No. 3 H 20.—Terra-cotta basins standing on three legs.

No. 12 (S and D 64).—Fragment of black ware representing a woman's head, found in Chacultepec. The figure has an elaborate head-dress and ornaments in the ears.

Upon Tablet 13 are two feet of a vase, in the form of animals' heads.

Upon Tablet 15 *a* and *b* are portions of terra-cotta figures.

Upon Tablet 16 *l* is a jade bead, presented to the Collection by the Trustees of the Christy Musuem.

H 20.

No. 4.—Double bottle in red ware (modern), presented by Mr. W. D. Wilkes.

CASES E 7 AND H 20.

POTTERY FROM NEW MEXICO.

E 7.

Upon Tablets 17 *a* to *c*, 18 *a* to *f*, and 19 *a* to *f* (S and D 19), are fragments of ware ornamented with red, black, and white paint, from the ruins of Casa Blanca, on the river Gila.

H 20.

No. 1 (S and D 18).—Large vase, ornamented with black and white paint. Brought across the plains by Governor Lane.

No. 5 (S and D 16) and No. 6 (S and D 17).—Shallow bowls of black ware, such as are still made and used by the Indians of the present day.

TUMULI OF THE CENTRAL DISTRICT OF NORTH AMERICA.

From Florida to Canada, and from the Atlantic to the Pacific Ocean, the American soil is strewn with tumuli, entrenched camps, and other earthworks. These monuments are particularly numerous in the valleys of the Mississippi and the Ohio. Tumuli, however, exist in Oregon, on the banks of the Gila, of the Colorado, and their tributaries. The plan and construction of these monuments differ according to the place where they were erected, and they are, probably, the work of various peoples. In the vicinity of the Great Lakes, and in the States of Wisconsin, Iowa, Michigan, and Missouri, the tumuli are sometimes of conical form, but they are frequently in the shape of quadrupeds, birds, reptiles, and even of man.

MOUNDS OF OHIO.

A systematic examination of a considerable number of tumuli in the Scioto Valley, Ohio, was undertaken some years since by Messrs. Squier and Davis, who class the mounds examined by them as—

1. Altar mounds.
2. Mounds of sepulture.
3. Temple mounds.
4. Anomalous mounds.

ALTAR OR SACRIFICIAL MOUNDS.

These mounds are said to occur only within, or in the immediate vicinity of, ancient earthworks forming enclosures. They contain symmetrical “altars” of burnt clay or stone, on which are deposited various remains, which in all cases have been more or less subjected to the action of fire. These “altars” are not of uniform size and shape. Some are round; others elliptical; others square, or parallelograms; some are small, measuring barely two feet across, while others are fifty feet long by twelve or fifteen feet wide. The usual dimensions are from five to eight feet. The “altars” are in the form of basins, made of a fine clay brought to the spot from a distance. They have

seldom been raised more than from twelve to twenty inches above the original surface-soil upon which they rest. The clay of which they are composed is usually burnt hard, sometimes to the depth of ten, fifteen, and even twenty inches. Regular strata of sand have been observed in the "altar mounds;" these bands conform to the convex outline of the mound.

MOUNDS OF SEPULTURE.

These mounds are destitute of "altars," do not occur within enclosures, and invariably cover a skeleton, usually deposited in a rude chamber of timber; occasionally the chamber is of rubble-stone.

TEMPLE MOUNDS.

Temple mounds are chiefly pyramidal in form, truncated, and generally with graded paths to their tops. In some instances they are terraced. Mounds of this class are not numerous in Ohio.

Along the Mississippi river, and especially towards the Gulf, these "temple mounds" increase both in number and in magnitude. In Kentucky they are more frequent than in the States north of the Ohio river; and in Tennessee and Mississippi they are still more abundant.

ANOMALOUS MOUNDS.

Anomalous mounds, according to the classification of Squier and Davis, include "mounds of observation" and such as have been applied to a double purpose, or of which the design and objects are not apparent.

"MOUND CITY."

Some of the most interesting objects in the Collection from America were obtained from a group of mounds, called by Squier and Davis "Mound City." "Mound City" is on the left bank of the Scioto River, four miles north of the town of Chillicothe, Ross county, Ohio. There are twenty-three mounds in this group; these are surrounded by a bank between three and four feet high, unaccompanied by a ditch.

The outline of the bank is nearly square, with rounded angles. Broad and deep pits, from which the earth has been taken to form the mounds, are on the outside of this bank.

MOUND NO. 1, "MOUND CITY."

This mound is seven feet in height, and is fifty-five feet in diameter at the base. The "altar" in Mound No. 1 was of burnt clay, perfectly round. The substance of the altar is burnt throughout, though in a greater degree within the basin. This basin was filled with ashes, intermixed with well-made pottery, ornamented with incised patterns, of which No. 1 (S and D 8), Case E 6, is an example; and with the copper discs upon Tablets 2 and 3. Above this deposit, and covering the entire basin, was a layer of mica, in sheets, overlapping each other, upon which, immediately over the centre of the basin, was heaped a quantity of burnt human bones, probably belonging to a single skeleton. Three strata of sand were observed in this mound.

MOUND NO. 2, "MOUND CITY."

This mound is ninety feet in diameter at the base, seven feet and a-half in height, and is remarkably broad and flat. The altar in No. 2, unlike that in No. 1, was in the form of a regular parallelogram. At its base it measured ten feet in length by eight in width; at the top it was six feet by four. Its height was eighteen inches, and the dip of the basin was nine inches. Within the basin there was a deposit of ashes, three inches thick, and in it were the fragments of pottery upon Tablets 4 to 10 (S and D 9, 11, 12), Case E 6, and some shell and pearl beads, such as those in Case B 34, upon Tablets 4 to 7. Two strata of sand were observed in this mound, the lower of which in this, as in several other instances, rested directly upon the outer sides of the altar. Two recent secondary interments, by inhumation, had taken place in this mound. The skeletons were found at the depth of three feet from the surface of the mound. They were placed side by side, the head of one resting at the elbow of the other. Under and about the heads of both were deposited some large rough fragments of greenstone. With the skeletons were several stone hatchets, stone gouges, a very fine flake of hornstone about the size of the palm of the hand, and a number of implements made of bone and elk-horn; see specimens upon Tablets 15 to 25, Case B 34, and upon Tablets 16 to 19, Case D 19.

MOUND No. 3, "MOUND CITY"

Mound No. 3 is egg-shaped in form, and measures 140 feet in length, by fifty and sixty feet respectively at its greater and smaller ends; it is eleven feet in height. Two sand strata were observed in this mound. Although the "altar" was not fully exposed, yet enough was uncovered to ascertain its character and extent. Forty-five feet of its length was exposed, and, in one place, its entire width, which was eight feet across the top, by fifteen at the base. The length of the altar could not have been much less than sixty feet. The relics were found in the inner basin. The altar was burnt to the depth of *twenty-two* inches. Upon careful examination it was found that three altars had been built, one upon another, as if one had been used for a time, until, from defect, or some other cause, it was abandoned, when another was formed over it. In the outer basin of the altar were found the traces of a number of pieces of timber, four or five feet in length, and six or eight inches in diameter. These had been partially burnt, and the carbonised surface had preserved their casts in the earth, although the wood itself had entirely perished. The pieces of wood had been covered up whilst still burning, for the earth around them was slightly baked. The relics found mixed with the ashes in the central basin consisted of fragmentary pottery, some leaf-shaped flint implements, an arrow-head of obsidian, a number of arrow-heads of hyaline quartz, two copper chisels, several tubes formed of thin strips of copper, two carved stone smoking-pipes, and the other objects exhibited in Cases C 34 to C 36. Only a single fragment of partially calcined bone was found on the altar. It was the *patella* of the human skeleton.

MOUND No. 4, "MOUND CITY."

This mound is oblong in shape, and measures at the base ninety feet in its longest and sixty feet in its shortest diameter. It is six feet in height, and has two sand-strata. The altar in this mound was remarkable from its depth, which was twenty-two inches, the hollow of the basin sinking a foot or more below the original surface of the soil. Nothing was contained in the basin, except a layer, about five inches in thickness, of a substance resembling lime mortar. Mingled with this were fragments of a few calcined shells.

MOUND No. 5, "MOUND CITY."

This mound is by the side of Mound No. 4, the bases of the two uniting; they are also both of the same size and form. The "altar," however, in No. 5 is more like that in No. 2, although somewhat smaller. It contained about thirty pounds weight of galena in pieces ranging from two ounces to three pounds; also several lumps of fine clay. Around this deposit there was a quantity of charcoal. Although the galena was but slightly burnt, yet the "altar" bore marks of intense heat, showing that it had been previously subjected for a considerable period, or at frequent intervals, to the action of fire.

MOUND No. 7, "MOUND CITY."

This mound is much the largest within the enclosure. It measures seventeen feet and a-half in height, by ninety feet in diameter at the base. At the depth of nineteen feet a smooth level floor of clay, slightly burnt, was found; this was covered with a layer of sand, about one inch in thickness. Resting on this was a crescent-like figure, formed with sheets of mica, which overlapped each other like the scales of a fish. The sheets are about ten or twelve inches in diameter. See No. 24, Case E 6. The crescent was about twenty feet from horn to horn, and about five feet in width. The outer edge of the crescent rested on an elevation, or ridge, of sand, six inches in height. The clay floor of this mound was but a few inches in thickness.

MOUND No. 8, "MOUND CITY."

The greater part of the stone smoking-pipes in the Collection were obtained by Squier and Davis from this mound. A stratum of sand overlaid the altar. Immediately under the sand was a layer, a few inches thick, of burnt loam; beneath this, in a hollow, was a deposit of ashes, containing about 200 stone smoking-pipes, many pearl and shell beads, several discs and tubes of copper, and a number of copper ornaments covered with silver.

The altar, was six feet two inches in length and four feet in width. The whole of the objects found upon the altar had been exposed to a heat sufficiently intense to fuse some of the copper objects. The pipes also are greatly injured, many of those

made of limestone, or containing calcareous matter, having been reduced to the condition of caustic lime, whilst others have been split into pieces, such as those in the glass dishes, Nos. 11, 18, and 19, Case E 6, and No. 2, Case E 9.

MOUNDS, Nos. 6 and 9, "MOUND CITY."

No relics were found upon the altars of these mounds, neither did they contain ashes or charcoal.

MOUND No. 18, "MOUND CITY."

In this mound the usual altar was present, and upon it was a thin carbonaceous deposit, but no relics were found. Traces of a secondary interment by cremation were observed.

MOUNDS Nos. 14, 15, 16, 19, 20, 21 and 23, "MOUND CITY."

These mounds are very small, the largest not being more than three feet in height, and they are all destitute of "altars." In each, burnt human remains were found, resting upon the original surface-level, in no case exceeding the bones of one skeleton. The body appears to have been burnt elsewhere, for there is a total absence of all trace of fire, except upon the bones themselves. In Mound No. 19 these burnt bones had been deposited in a cist sunk in the soil. Squier and Davis suggest that the bodies were *burnt* upon the "altars," and that the calcined bones were then collected and buried beneath these minor mounds. A difficulty arises as to why the "altars" themselves, if such they were, should ultimately have been heaped over with earth, after they had served, time after time, for this purpose. Altars or "brick hearths," not covered with mounds, are said to have been discovered in America. One which existed near the town of Marietta, Ohio, is mentioned by Squier and Davis; it was surrounded by a low bank, about 100 feet in circumference.

Close to the town of Zuñi Viegà, New Mexico, in a cedar forest, there are some oval altars of earth, very low, and between two and three yards in length. These altars are described as having, at one of the extremities, "an arrow ornamented with feathers and a sort of network." At the other end, stuck into the ground, is a cedar stake carved "in the open-work style;" and in the middle of the altar, lying horizontally,

is another piece of cedar wood, carved in a similar manner, and surrounded with shells, and arrows of small size. Some of these altars are of great antiquity, and the Indians allow no strangers to touch them. Nothing, however, is said of fires having been lighted upon these earth-altars of New Mexico.

SOLITARY MOUND NEAR "MOUND CITY."

This mound is about a quarter of a mile to the south of "Mound City." It is surrounded by a ditch and bank, enclosing an area of twenty-eight acres, the mound being in the centre. The height of the mound has been reduced by cultivation. It now stands about five feet above the level of the soil, and is about forty feet in diameter at the base. The "altar" in this mound differs from those already described, and appears to have been formed at different intervals of time. A circular cist, thirteen feet in diameter and eight inches in depth, was sunk below the level of the surface soil; this was filled with fine sand, which was carefully levelled, the upper surface being perfectly horizontal. Upon this, fire appears to have been kept burning sufficiently long to discolour the sand to the depth of an inch. After this had taken place, a basin-shaped "altar" of sand was formed upon the horizontal sand-bed; this basin measured seven feet in diameter, and was eight inches in depth; it was carefully paved with small round stones, each rather larger than a hen's egg, placed with great exactness, and firmly imbedded in the sand. Upon this paved altar some ashes, containing human bones, were found, and ten copper armlets, placed in two heaps, five in each, encircled some calcined bones. On the western slope of the altar were two thick plates of mica. Squier and Davis only met with one other mound in which the altar was covered with stones. In this mound, No. 5, "Clark's Work," there was also a layer of stone slabs, following the outline of the mound, at the depth of about three feet from the surface, in a similar manner to that of the layers of sand in the mounds previously described.

"CLARK'S WORK."

"Clark's Work," on the north fork of Paint Creek, is one of the largest and most interesting earth-works in the Scioto Valley; it is in the form of a parallelogram, 2800 feet long by

1800 feet broad, with one corner somewhat rounded. A semi-circular embankment, within the larger enclosure, and surrounding the Mounds Nos. 5 to 8, is 2000 feet in circumference. The embankments measure together nearly three miles in length, and the works, including the mounds, must have necessitated the excavation and removal of not less than three millions of cubic feet of earth.

Squier and Davis class "Clark's Work" as a work of defence, although they admit that it differs, in position and some other respects, from the other entrenched hills which have come under their notice. It is by no means proved, however, that the mound-builders converted this position into a defensive post; this may have been done by some later tribe, who merely availed themselves of the advantageous configuration of the ground. For instance, the level of the soil within the semi-circular enclosure is elevated above the surrounding ground, and the three long mounds within it are united at their bases, forming a continuous elevation, thirty feet in height and five hundred feet in length. Such a position would be seized upon at once as a ready-made work of defence, requiring merely the addition of the slight circumvallation and ditch by which it is now surrounded. All the other natural advantages of the position were secured in constructing the outer work, and no doubt the mounds were merely utilised as hills. The way in which they are scattered, both within and without the entrenchment, appears to confirm this view. The mounds may have been, and probably were, constructed at an earlier period than the entrenchments, and perhaps by a totally different people. Squier and Davis, however, regard "Clark's Work" as a fortified town or city of the ancient mound-builders.

MOUND NO. 1, "CLARK'S WORK."

This mound, although very rich in relics, was one of the smallest examined. It was not more than three feet in height. No "altar" was found in it. The relics appear to have been placed upon the surface of the soil, which was much burnt, over a space about fifteen feet in breadth. A bed of earth, about a foot in depth, was heaped over the relics. Upon this a layer of small stones was placed; these stones were covered by a layer of earth about two feet in thickness. In Mound No. 1 some stone pipes, Nos. 12 and 13, Case E 6, were found, the bowls of which are in the form of coiled serpents. These were carefully

enveloped in sheet mica and copper. Some fragments of bone, with carving upon them, upon Tablets 2 to 4, Case B 33; a large number of fossil sharks' teeth, upon Tablets 5 and 6, Case B 33, and other objects were also found in this mound.

MOUND NO. 2, "CLARK'S WORK."

This mound is remarkably broad and flat. It measures about eighty feet in diameter, and is no more than six or seven feet in height. Two strata of sand were observed, but no trace of an "altar" was met with. In its place were two layers of hornstone cores and implements, placed side by side, a little inclining, one layer resting immediately upon the other. An excavation, six feet in length by four in breadth, exposed upwards of six hundred of these implements, but the full extent to which they reached on all sides was not ascertained. Some of these implements are shown in Case A 51, Nos. 1 to 8.

MOUND NO. 5, "CLARK'S WORK."

In this mound the "altar" was covered with stones, and instead of the usual sand-stratum, there was found a layer of flat stones corresponding to it. The "altar" was composed of earth raised two feet and a half above the original level of the soil. It was five feet in length by three feet four inches in breadth; the sides sloped at an angle of nearly thirty degrees. This "altar" was faced on the top and on the sides with slabs of stone, quite regular in form and thickness, and which, although undressed, were closely fitted together. The stone is known as the Waverley sandstone, a variety underlying the coal series, thin strata of which cap the hills bordering these valleys. The modern Indians had opened the mound, and buried one of their dead on the slope of the altar. The marine shell (*Cassis*) which was found in this mound was probably placed there by them; it is shown in Case E 6, No. 26. A few pearl beads and other objects, which formed part of the original deposit, were recovered. The "altar" bore the marks of fire.

MOUND NO. 9, "CLARK'S WORK."

This mound has several peculiar features. The "altar," instead of occupying the centre, was placed considerably towards one side, and a deposit of charcoal filled the corresponding opposite side. A stratum of sand curved over

the "altar," and a second band of sand curved over the charcoal. The "altar" was the smallest met with. It was round, and did not measure more than two feet in diameter. Notwithstanding its small size, numerous relics were found on it. Among these, in Case B 33, are the obsidian spear-heads, Tablets 22 to 26; the scrolls of mica, Tablets 27 to 30; some small bone implements, Tablet 20; some pearl beads, and some thin narrow slips of copper. The relics were covered with a layer of charcoal, about six feet in diameter, which had been covered up with earth while burning.

MOUNDS OF SEPULTURE.

MOUND *c—e*, LIBERTY TOWNSHIP, ROSS COUNTY, OHIO.*

This tumulus is in form an irregular oval, one hundred and sixty feet in length, ninety feet in breadth at its larger end, and twenty feet in height. An excavation disclosed a cist of timber, eight feet square. Posts, eight inches in diameter, had been driven eighteen inches into the soil, at the outer corners of the cist, as if to support the structure. Of course the wood had perished, but perfect casts of the posts remained in the compact earth which formed the mound. A partly-burned skeleton was found in this cist, and with it the thin copper plate, No. 11, Case A 51, and the stone smoking-pipe, No. 12. The bones appeared to have been enveloped in matting. The floor of the mound, so far as it was examined, was composed of clay, which, after it was laid, had been burnt to considerable hardness. A second excavation in another part of the mound disclosed an "altar" of burned clay at the depth of twenty feet. This "altar" was sunk below the original surface of the soil, and was surrounded by an enclosure of timber, similar to that found in the other shaft.

MOUND NO. 1. PLATE II. "ANCIENT MONUMENTS OF THE MISSISSIPPI VALLEY."

This mound is on the east bank of the Scioto river, about six miles below the city of Chillicothe. It is twenty-two feet in height, and contained a timber cist upon the original level of the soil; in this was a human skeleton, having a necklace com-

* So marked upon plate xx. 'Anc. Mon. Miss. Valley,' p. 56.

posed of a triple row of shell beads and the canine teeth of animals, such as those upon Tablets 8 to 11, Case B 34.

In some of the "sepulchral" mounds, as in this instance and in the mound *c—e* last-mentioned, the skeleton was enveloped in bark or matting.

Upon Tablet 22 (S and D 734), Case C 38, is a portion of bark imbedded in clay, upon which the skeleton in this mound was found.

MOUND NO. 3. PLATE II. "ANCIENT MONUMENTS OF THE MISSISSIPPI VALLEY."

This mound is close to the city of Chillicothe. It is chiefly remarkable from the circumstance, that in it was found the only wedge-shaped (rubbed) stone hatchet obtained from any of the mounds opened by Squier and Davis. The mound is between twenty and twenty-five feet in height. Upon the original level of the ground there was a layer of charcoal and ashes, six or eight feet square, and from six inches to a foot in thickness. In this deposit were fragments of human bones, the stone hatchet already mentioned, several thin pieces of copper which had been hammered, and some fragments of the harder and less common kinds of stone. The heat of the fire had been sufficiently intense to almost consume the skeleton; earth had been heaped over the fire while it was still burning, for the charcoal was coarse and clear, and the earth was quite baked immediately above the deposit.

The stone hatchet No. 6 (S and D 377), Case A 50, does not appear to have been exposed to the action of fire. This circumstance, coupled with the fact that it is the *only* example of the type which has been found in the mounds, suggests the idea that it formed no part of the original deposit, but was probably introduced at a later period, and may have been connected with a secondary interment.

MATERIALS OF THE OHIO PIPES.

The following notice of the materials used by the mound-builders for their "gorgets," smoking-pipes, &c., has been most kindly contributed by Professor Church, of the Royal Agricultural College, Cirencester, who not only carefully

examined the specimens themselves, but has made analyses of the principal varieties which occur in each class of material.

The materials of the Ohio pipes and other objects are almost exclusively of four kinds; or rather they may be classed under four distinct heads, although two or more varieties of some of the materials occur. The materials are sculptured native substances, and have not been moulded or fashioned by pressure, nor hardened by subsequent baking. I will first name the four sorts, and then proceed to describe their individual physical and chemical characters:—

- A. A hard and silicious clay slate, approaching more or less closely in different specimens the *whetslate* of Cotta.*
- B. An argillaceous ironstone,† usually variolitic.
- C. A pearly-brown ferruginous *chlorite*.‡
- D. Calcareous marls of variable composition, and marly limestones.§

A. WHETSLATE.

I have particularly examined a fragment of a “gorget” made of this stone (S and D 494). It has the hardness 6·5 on the mineralogical scale. Its density is 2·76. On analysis it gave in 100 parts:—

Silica (with some alkali)	61·35
Ferrous oxide (protoxide of iron)	14·28
Alumina	19·33
Magnesia	·33
Lime	1·34
Combined water	3·37
	<hr/>
	100·00

This material is a more or less highly silicious variety of clay slate, almost perfectly compact, and often very distinctly stratified with dark bands, in which most of the iron of the rock seems collected. It breaks with an irregular conchoidal fracture, almost without a trace of the peculiar cleavage known as

* Cotta, ‘Rocks Classified’ (Eng. ed., 1866), p. 265.

† Dana, ‘Mineralogy’ (1868), p. 141.

‡ Ibid., p. 495.

§ Cotta, *l.c.*, pp. 272—279.

slaty. It generally forms a good hone stone. The skill with which the mound-builders have pierced and worked this hard and tough stone is remarkable. Among the most characteristic specimens of whetslate in the Blackmore Museum we may name the following:—Case A 48, No. 35; Case A 49, No. 1; No. 9; No. 11, which shows fracture; No. 27, which shows stratification; Case A 50, No. 3. A further remark should be made as to one specimen in the Collection, Case C 35, No. 10, which shows the junction of whetslate with a peculiar felspathic stone which has been described as greenstone ash, and is distinctly porphyritic in texture. The Cornish *killas* now and then passes, just in the same manner, into a porphyritic rock.

B. ARGILLACEOUS IRONSTONE.

This stone, like the whetslate above described, is not a definite mineral, but a mixture of minerals—a rock. Its hardness varies in different parts of the same specimen—the harder parts approaching 6, and the softer parts not exceeding 4·5. These softer parts are paler in colour, contain much less iron than the harder parts, and seem to consist of minute globules of a compound silicate, perhaps a felspar. Some of the pipes and other objects fashioned from this ferruginous stone are much fissured internally, and blacker inside than out. When most compact, this stone has the density 4·3; when least so, about 3·07. In the following analysis the silica was ascertained “by difference,” and includes a little alkali. In 100 parts there are:—

Silica	46·42
Ferric oxide (peroxide of iron)	34·80
Alumina	16·45
Magnesia	·46
Lime	1·48
Water	·39
	<hr/>
	100·00

The Collection contains many examples of this curious clay ironstone. Some of these approach in structure to the red pipestone (Coteau des Prairies), often termed *Callinite*. But they are more variolitic in texture, and much more mottled and diversified in colour. Some specimens are iron grey or dark brown; others pale grey, spotted with white. Case A 50, Nos.

25 and 26, are specimens of the pale variety of this stone; the dark grey and brown varieties may be seen in Case C 35, No. 8, and in Case C 38, No. 9. No. 14, in Case C 38, shows distinctly the white spots seen in some specimens of *Callinite*. No. 6, No. 12, and No. 13, in Case C 35, approach *Callinite*. Other good specimens are No. 5, Case C 34; No. 6, Case C 36; and No. 11, in Case C 37.

C. CHLORITE.

This is an obscure and perhaps rare variety of the mineral known as chlorite. But though this stone is apparently a definite mineral species, the term chlorite is rather wide, and very careful optical, as well as chemical, analysis is needed to refer such specimens to their proper place.* The hardness of the particular piece of Ohio chlorite (S and D 553) which I have specially studied is 2.75; its density is 2.9. The stone is made up of small lamellar crystals, presenting a varied lustre, a pearly aspect, and a pinchbeck brown colour. It appears to be accompanied by a trace of quartz. The most characteristic specimens of this chlorite in the Blackmore Collection are the following:—Case B 33, Tablets 12, 13; and Case H 4, No. 3. A more ordinary variety of chlorite, soft and green, may be seen in Case A 50, Nos. 25 and 26.

D. CALCAREOUS MARLS AND MARLY LIMESTONES.

Some of the pipe materials are characterised by strong effervescence with acids. Some of them seem to have been made from marls; that is, natural earthy mixtures of clay and calcareous matter. From their composition and softness, they would offer less difficulty in manufacture, but would be more liable to injury both by moisture and fire than the materials already described. They are varied in colour, but are generally pale and of earthy aspect, and adherent to the tongue. Some are white, some buff and brown, and some marbled. One of the pieces analysed (No. 1) was slightly sub-crystalline, but usually they are quite amorphous and homogeneous in texture.

* For the best classification of the species and varieties included under chlorite, see Descloiseaux, 'Mineralogie,' tome i. pp. 435—483.

Their hardness varies somewhat, but is never high. No. 1 has the hardness 2·3, and No. 2 is 2·0. The density of both is about 2·5.

The following are the analytical results from two of these calcareous materials :—

	Calcareous Marl.	Marly Limestone.
	No. 1.	No. 2.
Silica	27·18	5·31
Alumina and ferric oxide . . .	11·95	2·23
Calcium carbonate (carbonate of lime)	45·97	82·49
Magnesium carbonate (carbonate of magnesia)	13·55	4·05
Other substances and loss . . .	1·35	5·92
	<u>100·00</u>	<u>100·00</u>

The following specimens belong to this division as to material :—

Case A 48, No. 7, Case A 49, Nos. 2, 3, and 25; Case C 34, No. 6, the white variety; Case C 34, Nos. 8, 10, 12, the marbled variety; Case C 35, Nos. 3 and 5; Case C 36, No. 9. Case C 37, No. 6, shows a darkening of one part. A discolouration probably produced by a process similar to the “stifle” burning by which the dark colour of the Roman pottery, known as Upchurch ware, seems to have been produced. Of course, the effect in the case now considered was an accidental result of the cremation.

A. H. CHURCH.

Royal Agricultural College, Cirencester,
December, 1869.

OBJECTS FOUND IN MOUND No. 1, "MOUND CITY."

E 6.

No. 1 is a vessel of brown ware, with a flat bottom; its general form is quadrilateral, with the angles rounded off. The upper part of the vessel is missing, but probably not more than the rim is gone; its present height is five inches, and its greatest diameter is five inches and a-half. The clay is well tempered; the burning appears to have taken place in an open fire; there is a slight glaze upon the surface, due perhaps to the application of some resinous substance. This vessel is ornamented with incised lines, and dots of two sizes; the larger dots have been made with a narrow tool hollowed like a gouge; judging from the width, the lines may have been made with the same tool, although the hollowed side of the implement was not used in forming them. The pattern is divided into four compartments by lines and dots which occur at each of the angles. It has been suggested that the pattern in each of these compartments is intended to represent a bird; some of the lines *do* form an object having a faint resemblance to a bird's head and neck, with the eye correctly placed, but the beak is of a most unnaturally recurved shape.

Upon Tablets 2 and 3 are some copper bosses or flat beads, made of two plates of hammered copper, each having a central perforation; these bosses range from one and a half to two inches in diameter. Plates of mica were found in this mound.

OBJECTS FOUND IN MOUND No. 2, "MOUND CITY."

B. 34.

In this mound some shell and pearl beads were found, similar to those in this Case, upon Tablets 4 to 7; as well as the fragments of pottery upon Tablets 4 to 10. The objects upon Tablets 15 to 25 were found associated with a secondary interment. The specimens upon Tablets 19 to 21 are bone implements of different forms with curiously dentated edges. Upon Tablet 24 is a piece of antler in process of manufacture into the handle of some implement. Upon Tablets 22 and 23, and in Case D 19 upon Tablets 16 to 19, are pieces of antler,

showing marks of cutting. The piece of antler upon Tablet 25 illustrates the way in which chisels, such as those upon Tablets 16 and 17, were formed. A deep groove was sawn about half way through the horn on each side in order to guide the fracture; the severance was then effected by a sharp blow, after which the implement was rubbed into shape.

OBJECTS FOUND IN MOUND NO. 3, "MOUND CITY."

CASES C 34 TO C 36.

C 34.

Upon Tablets 15 and 16 are fragments of the "altar." Upon Tablets 17 to 22 are fragments of leaf-shaped flint instruments, fractured by the heat to which they have been exposed. Nos. 23 and 24 are two glass dishes containing pieces of manganese garnet. No. 25 is a glass dish containing fragments of quartz crystals fissured by heat, among which are some unfinished implements.

C 35.

Upon Tablets 15 to 22 are leaf-shaped flint implements, all of which have been exposed to the action of fire. No. 18, No. 19, No. 20, No. 21, and No. 22, are good specimens, and are nearly perfect. In the dishes No. 23 to 25 are some fragments of quartz crystals fissured by heat.

C 36.

Upon Tablet 15 and in the glass dish No. 26 are fragments of leaf-shaped flint implements. Upon Tablet 16 is a barbed spear-head of obsidian. Upon Tablets 17 to 21 are fragments of arrow- and spear-heads of hyaline quartz, greatly injured from the heat to which they have been exposed. The specimens upon Tablets 20 and 21 are tolerably perfect. *b* Tablet 21 is part of a stemmed arrow-head of hyaline quartz; *c* is a leaf-shaped arrow-head of the same material. Upon Tablet 22 are pieces of copper tube. Upon Tablet 23 is a long, narrow, copper chisel. No. 24, **D***, is a smoking-pipe of coralline limestone, of simple form. No. 25, **D**, is a stone smoking-pipe,

* The letters **A**, **B**, **C**, **D** appended to the numbers of the specimens refer to the several materials described at pp. 106—109.

the bowl of which is in the form of a bird, perhaps intended for a toucan.

The rude earthen vessel No. 28, Case E 6, was found associated with a secondary interment in this mound.

OBJECTS FOUND IN MOUND NO. 5, "MOUND CITY."

C 38.

Upon Tablet 19 is a mass of fine clay, of which a considerable quantity was found in this mound.

Upon Tablets 20 and 21 are pieces of galena, a large quantity of which was also found in Mound No. 5.

OBJECTS FOUND IN MOUND NO. 7, "MOUND CITY."

CASE E 6.






No. 24.—Plates of mica, found covering the "altar," arranged in a crescent-like form.

The two wedge-shaped copper hatchets, Nos. 23 and 29, Case E 6, were found near the surface of Mound No. 7, "Mound City," and perhaps belong to a secondary interment.


OBJECTS FOUND IN MOUND NO. 8, "MOUND CITY."




CASES C 34 TO C 39.




C 34.


Nos. 1 to 17 are sculptured stone smoking-pipes found upon the "altar" of this mound. No. 3, , is much injured from the heat to which it has been exposed. It is stained from having been in contact with some copper object. No. 4, , is made from a coralline limestone, a material no doubt selected on account of the beauty of the markings. No. 6, , is also made of coralline limestone. No. 11, , is tastefully ornamented around the rim of the bowl. No. 12  var., is ornamented with circular indentations.


C 35.

Nos. 1 to 14 are stone smoking-pipes. The bowl of No. 2, , is in the form of a tortoise.





Nos. 3, , 4, , and 5, , each have a bowl in the shape of a frog.

Nos. 6, , 7, , and 8,  var., have the bowl in the form of a toad.

Nos. 10 to 14 represent birds of various kinds; No. 12, , represents the swallow; a series of zigzag lines are to be noticed upon the belly of this bird. These markings only occur in the mound-sculptures upon birds of rapid flight, and it is probable that this lightning-like marking was intended as a symbol of swiftness.




No. 13,  var., represents the tufted cherry-bird; the head of this bird is out of proportion to the body—a not infrequent fault committed by the sculptors of the mound period. The fire upon the altar has, in nearly every instance, destroyed the substance which was placed in the eye-sockets of many of the pipes; the pearl, however, which forms the eye of No. 13 has escaped destruction.


C 36.



Nos. 1 to 14 are stone smoking-pipes; No. 2, , represents the quail; No. 5, , the heron; and No. 6, , the tufted heron; the small body; long wings, extending to the extremity of the short tail; the long thin neck, sharp bill, and tufted head are faithfully rendered in this sculpture. The bird is represented in the act of striking a fish. No. 11, , represents a bird; it has an inserted eye of some undetermined substance.


C 37.

Nos. 1 to 23 are stone smoking-pipes.

No. 4, , (altered by heat), represents the Toucan feeding from a human hand. This bird is found in the tropical countries of South America. Pozzo mentions that the toucan can be very easily tamed. Other travellers inform us that these birds are very highly prized by the Indians of Guiana and Brazil, principally on account of their brilliant plumage. They pick off the skin from the breast, containing the most beautiful feathers, and glue it upon their cheeks by way of ornament. In some districts the toucan was almost the only bird the aborigines attempted to domesticate. The fact that it is represented, in the mound-sculptures, as taking its food from the human hand is, therefore, highly interesting. No. 7, , 8, , and 22, represent the Owl.







No. 9, , represents the Turkey Buzzard.




No. 10, , is an unfinished pipe. No. 19, , also appears to be unfinished.

No. 11, , is a fragment of a pipe which represents a bird of prey, either an Eagle or a Hawk.


C 38.

Nos. 1 to 14 are stone smoking-pipes.

Nos. 1, , and 2, , represent eagles or hawks each tearing a small bird to pieces. The zigzag markings already noticed may be seen on both these hawks. No. 3, , has the bowl in the form of a small rodent, placed in a very graceful attitude. The pearl eyes of this specimen remain in the sockets, but in a calcined state. No. 4, , represents the squirrel; No 5, , the beaver. Three figures of the beaver have been obtained from the mounds, all in the characteristic attitudes of that animal; the large head, blunt snout, small eyes and ears, and broad oval scaly tail, are all faithfully represented. No. 6, , represents the head of the elk. This is one of the least faithful of the mound sculptures.





Nos. 8, , 13, , and 14, , represent the Lamantin, Manatee, or Sea-Cow. This animal is found in tropical regions. Seven sculptured figures of the Lamantin have been obtained from the mounds, of which three are nearly perfect. The external features of the animal are faithfully and minutely exhibited in the sculptures. There is the truncated head, small and scarcely distinguishable eyes, thick semi-circular snout, peculiar nostrils, tumid furrowed upper lip, singular fins, and remarkable moustaches; and yet these figures represent animals not met with on the spot, but found a thousand miles distant, upon the shores of Florida, and even there only in small numbers. The minute details are given with too much accuracy to allow us to believe that these pipes were made by any people who were not well acquainted with the animal and its habits.

In one particular, however, the sculptors of the mound-period committed an error. Although the Lamantin is strictly herbivorous, feeding chiefly upon sub-aqueous plants and littoral herbs; yet one of the stone smoking-pipes represents this animal with a fish in its mouth.

No. 9, , is perhaps intended for the walrus. The figure in this instance, and this instance only, is represented seated


across the pipe; in every other case the animal-figures are so sculptured as to face the smoker.

C 39.

Nos. 1 to 13 are carved stone smoking-pipes. In the box No. 1 are three fragments of pipes representing the heads of animals, *a*, , probably the racoon; *b*, , bear; and *c*, , wolf; Nos. 2 to 6, and No. 8 represent the wild cat, and other animals of the same genus. No. 7, , represents the wolf.

Few representations of the human head have been found in the mounds. Four were taken from the altar of Mound No. 8, "Mound City," three of which are bowls of smoking-pipes. No. 9 is the cast of a smoking-pipe. The original, which is in the Collection of Mr. E. G. Squier, is of compact black stone; it differs from Nos. 10, 11, and 12 in having a greater hardness and severity of outline.

The figure wears a singular head-dress, falling in a broad fold over the back of the head as far down as the middle of the neck. Upon each side of the top of the head, this head-dress rises into projections like horns. Encircling the forehead, and coming down as low as the ears, is a row of fifteen small round holes, placed as closely as possible together, some of which, when the head was found, were filled in part with pearls, completely calcined, and only recognisable from their concentric lamination. The holes were doubtless all originally filled in the same manner. Some ornamental lines are deeply cut upon the face. The mouth is compressed, and the brows are contracted, giving the countenance an aspect of severity.

No. 10, , resembles No. 9 only in having the peculiar markings on the face.

The features are bolder, and the outline of the face is quite different. The nose is large and prominent, the eyes are sunken and almost closed, the forehead is high and narrow. A portion of the hair appears to be gathered in festoons upon either side of the head above the ears; the remainder projects in a kind of knot from the back of the head. Upon the top of the head is a lappet or fold, which seems detached from the other parts of the head-dress, and simply rests upon the forehead. The ears are perforated; and, from the strongly attached oxide of copper around the holes, they were probably ornamented with rings of that metal. This head, unlike the

others, has not formed part of a pipe. The material is a compact yellow limestone, very much altered by fire.

No. 11, *M*, is made of the same variety of stone as No. 10. The features of this head are more regular than those of either of the preceding examples. The nose turns up slightly at the point, and the lips are prominent. The eyes seem closed, and the whole expression of the face is that of repose, perhaps of death. The head-dress is simple; and the ears, which are large, are each perforated with four small holes around their upper edges. At the lower and posterior portion of the head two holes are drilled, in convergent directions, each one-fifth of an inch in diameter, and half an inch in depth; were they continued one-fourth of an inch further in the same direction they would intersect each other. The head is destitute of markings upon the face. It has been suggested, from the greater delicacy of the features, that this specimen was intended to represent the head of a woman.

No. 12, *M*. This is evidently intended to represent the head of a woman. It is carved from a compact stone, which is much altered by the action of fire. The muscles of the face are faithfully rendered, and the forehead is finely moulded. The eyes are prominent and open, and the lips are full and rounded. Whether the head is encased in a sort of hood, or whether the hair is platted across the forehead and down the sides of the face, it is not easy to determine. The knobs at the top of the forehead and at the back of the ears may be either intended to represent the manner in which the hair was gathered or wound, or they may be ornaments attached to a head-dress.

These heads are valuable, as being the only examples obtained from the Ohio mounds. Upwards of a hundred miniature sculptures of animals were found associated with them, and the fidelity to nature observed in the latter fully warrants us in believing that the sculptures of the human heads are equally true to nature, and that they display, not only the characteristic features of the ancient mound-builders, but also their method of dressing the hair, the style of their head-dresses, and the character and mode of wearing some of their ornaments.

The markings upon the faces of two of these sculptures may be intended to represent lines of paint or some description of tattooing. We know that, among the North American tribes, the custom of painting the face with various colours, and of ornamenting it with fantastic figures, was widespread and

common. The singular head-dresses of the mound-figures bear little resemblance to those of the present race of Indians, who usually only permit a single tuft of hair to grow, which hangs from the centre of the scalp; the hair of the women was allowed to fall loosely upon the shoulders, or was simply clubbed behind. Plumes of feathers, or the dried skins of the heads of certain animals, form their only kind of head-dress. The practice of wearing rings and pendants in the ears appears to have existed among the mound-builders; it is likewise almost universal among the Indians of North America and the Central American tribes.

These sculptures do not represent features essentially different from those of the great American family, the type of which seems to have been radically the same throughout the extent of the continent, excepting, perhaps, a few of the tribes inhabiting the extreme northern and southern regions.

C 37.

Upon Tablets Nos. 25 and 26 are objects found, with the stone smoking-pipes already described, in Mound No. 8, "Mound City." Upon Tablet 25 *a* are a number of copper beads molten together from the heat to which they have been exposed upon the "altar." Upon Tablet 25 *b* to *l* are beads made of shell, coated with copper and then with silver. Silver has been found in very small quantities, and was evidently exceedingly rare among the mound-builders. Professor Church has analysed one of the fused masses found in this mound, and writes thus:—"It contains .19 per cent. of metallic silver, and .45 per cent. of tin and antimony. Silver is found in American native copper, but only in the proportion of from .03 to .006 per cent.; the silver in the mound specimen analysed by me is probably due to a plating upon the copper. I do not think that tin ever occurs in native copper to the extent in which it is present in your specimen; usually it is entirely absent. The mass, however, is copper, not bronze." Upon Tablet 25 *m*, *n*, *o*, are some star-shaped ornaments of shell, coated with copper.

Upon Tablet 26 is a stone, *C*,* "gorget." This specimen has been much altered by heat; the circular striæ left by the drill in boring the hole can be distinctly seen.

* See page 108.

OBJECTS FOUND IN "SOLITARY MOUND," NEAR "MOUND CITY."

C 38.

Upon Tablets 16 to 20 are some copper armlets. Ten of these armlets were found in this mound; they were placed in two heaps, five in each, and encircled some calcined bones—probably those of the arms upon which they had been worn. They consist of a plain rod of copper hammered out, and so bent that the ends approach or lap over each other. They measure about two inches and a half in diameter, and weigh four ounces each. The specimen *b*, on Tablet 20, shows that the metal was merely doubled over and hammered into shape. Simple rings of bent copper, the ends not united, were in general use with the North American tribes at, and prior to, the European conquest of the country.

OBJECTS FOUND IN MOUND NO. 1, "CLARK'S WORK."

CASES A 50, B 33, AND E 6.

E 6.

Nos. 12, *m*, and 13, *m*, are two stone smoking-pipes, each having the figure of a snake coiled around the bowl. These pipes when found were carefully enveloped in sheet mica and copper.

B 33.

Upon Tablet 1 is part of a bone tube, the bore of which is *oval*, not circular. Upon Tablets 2 to 4 are some pieces of bone ornamented with carving; the lines are sharply and delicately cut. Upon Tablets 5 and 6 are some fossil sharks' teeth; the specimen *c* on Tablet 6 has been drilled for suspension. Upon Tablets 7 to 10 are some reptilian teeth much injured by fire; the three specimens on Tablet 10 show human workmanship; *b* has been sawn, and *c* has been worked to a flat surface. Upon Tablet 11 *a* is a terra-cotta stamp representing a coiled rattlesnake; both faces of the tablet bear similar figures, one side, however, is plane, and the other slightly convex. This material

is described by Squier and Davis as being a very fine-grained, cinnamon-coloured, sand-stone. The tablet is six inches and a quarter in length, one and three-eighths in breadth, and a quarter of an inch in thickness. The other tablets *b* and *c*, in this Case, when found were wrapped in thin plates of copper; they also were obtained from Mound No. 1, "Clark's Work." Altogether fragments of four tablets were found in this mound. Squier and Davis mention that they appear to have been painted of different colours; "a dark red pigment is yet plainly to be seen in the depressions of some of the fragments; others had been painted of a dense black colour." No. 31, in Case A 50, is part of a stamp of terra-cotta found in another of the Ohio mounds. No. 32 in the same Case is an ideal restoration of the complete stamp. No. 37, Case A 50, is part of another terra-cotta stamp from a mound in Ohio.

Nos. 35 and 36, in Case A 50, are casts of the upper and under surfaces of a tablet found in a mound in the City plot of Cincinnati, associated with an inhumed skeleton, and some pointed bone implements, about seven inches in length, made from the tibia of the elk. These objects appear to have been deposited with the primary interment, which was in the centre of the mound, and rather below the original level of the ground. Several secondary and superficial interments had taken place in this mound. The tablet is carved from a piece of fine-grained, compact, sandstone, of a light brown colour. It measures five inches in length, three inches in breadth at the ends, two and three-fifths at the middle, and is about half an inch in thickness. The sculptured surface varies very slightly from a perfect plane. The figures are cut in low relief (the lines being not more than one-twentieth of an inch in depth), and occupy a rectangular space four inches and one-fifth in length, by two and one-tenth in width. The sides of the stone are slightly concave. Diagonal lines, eight at one end and seven at the other, are drawn across the surface near the ends. Exterior to these are notches, twenty-five at one end, and twenty-four at the other. The back of the stone has three deep, longitudinal, grooves, and several depressions, evidently caused by rubbing—perhaps produced in sharpening the tool used for cutting the sculpture. This tablet was found by Mr. Guest, of Cincinnati, in December, 1841, and is preserved in his collection.

Stamps of burnt clay have been found in Mexico, the faces of which are covered with figures in low relief; these, like the

Ohio tablets, were probably used for impressing ornamental figures on skins or other articles of clothing.

Upon Tablets 12 and 13 (S and D 462, 463, 464) are discoïdal stones, highly polished. They are made of the material C, described by Professor Church at page 108. Several delicately-carved objects of this material have been found in the neighbourhood; but objects carved from this variety of chlorite were not met with in any of the other mounds opened by Squier and Davis, with the exception of the "gorget" found in Mound No. 8, "Mound City." About thirty to forty of these discs were originally placed in this mound. It has been suggested that they were used in playing certain games, analogous to those known to have been practised by the North American tribes. The perfect polish of the edges of these specimens, however, weighs against this conclusion. Stone discs which have probably been used in games will be described hereafter. The discs found in Mound No. 1, "Clark's Work," are circular, and vary in size and thickness. The largest measures three inches and three quarters in diameter, by one inch and one-tenth in thickness; the smallest two inches and four-fifths in diameter, and nine-tenths in thickness. The others are of intermediate sizes; a few have their sides slightly convex, but the sides of most are perfectly straight. The pieces of worked stone upon Tablets 14 to 18 were also found in Mound No. 1, "Clark's Work."

OBJECTS FOUND IN MOUND NO. 2, "CLARK'S WORK."

A 51.

Nos. 1 to 8 are chipped implements of sub-opaque flint obtained from this mound; they were placed side by side, a little inclining, one layer resting immediately upon the other. Upwards of six hundred of these implements were found, but the full extent to which the deposit reached on all sides was not ascertained. The flint of which the implements are made occurs in beds belonging to the Secondary formation; one of these, called "Flint Ridge," exists in the counties of Muskingum and Licking, Ohio. It extends for many miles, and numerous pits, from which the flint has been taken, occur throughout its entire length; these excavations are often ten or fifteen feet in depth, and occupy some acres in extent. It is probable that the recent as well as the

more ancient races worked these quarries, just as they resorted to the celebrated quarry of the red-pipe-stone of the "Coteau des Prairies."

The flint objects, Nos. 1 to 8, closely resemble in form some of the flint implements found in the "drift" of England and France. No. 9 is a discoïdal flint implement, from the gravel at Milford Hill, near Salisbury; it is very like the hornstone disc No. 6, from Ohio.

Flint discs, in type resembling these specimens, appear to have been used in Europe during both the Palæolithic and the Neolithic periods; and similar discs of quartzite have been found at Clermont, near Toulouse, France, associated with remains of *Felis spelæa*, *Elephas primigenius*, *Rhinoceros tichorhinus*, and *Megaceros Hibernicus*.

The ovoïd flint implement, No. 5, agrees in type with No. 10, which was found in the drift at St. Acheul, valley of the Somme, France. Implements of drift-like types do not appear to occur very abundantly in North America, and those that have been found are either discs, heart-shaped, or of the oval and ovoïd forms; the pear-shaped and shoe-shaped types, met with in the drift of north-western Europe, seem not to have been found hitherto in the New World.

OBJECTS FOUND IN MOUND NO. 5. "CLARK'S WORK."

E 6.

No. 26 is a marine shell (*Cassis*), found in this mound. Neither this nor the shell *Pyrula perversa*, No. 25, could have been obtained nearer than the Gulf of Mexico. The inner whorls and columella have been removed from No. 26, perhaps to adapt it for use as a vessel; similar shells have been found in the vicinity of Nashville, from which the inner whorls have been removed so as to give place to an idol of clay. In the account given by Dr. Troost of some ancient remains found by him in Tennessee, he mentions a large shell of *Cassis flammea*, the interior whorls and columella of which were all removed, so that nothing but the exterior shell remains. This is open in front, and in it was placed a rudely shaped idol in the form of a kneeling human figure, made of clay mixed with pounded shells. This shell, like Nos. 25 and 26, must have been obtained from the tropics. It was ploughed up in the Sequatchy valley.

OBJECTS FOUND IN MOUND NO. 9, "CLARK'S WORK."

CASES A 51 AND B 33.

A 51.

In the glass dish No. 13 are some pieces of charcoal which formed part of the layer met with in this mound.

The small bone implements upon Tablet 20 Case B 33, were found in this mound, as well as some narrow and thin slips of copper, and some pearl beads similar to those upon Tablet 4, Case B 34.

B 33.

Upon Tablets 22 to 26 are fragments of obsidian spear-heads, fractured from the heat to which they have been exposed. Obsidian has not been found *in situ* nearer than Mexico; flakes, and arrow- and spear-heads, of obsidian obtained from five of the mounds, excavated by Squier and Davis, in the Scioto valley.

Upon Tablets 27 to 30 are thin sheets of mica, cut into scrolls, measuring six inches in length. Upon Tablets 31 and 32 are similar plates of mica, cut into circles two inches in diameter. These figures are shaped with the greatest precision; the edges are perfectly smooth, as if cut with a very sharp instrument; they do not exhibit the slightest irregularity, but are geometrically correct in outline. Each piece is perforated with small holes, such as could be produced with a blunt needle. These objects were probably used as ornaments to the dress.

Many of the American mounds contained mica, sometimes in plates of considerable thickness, but usually in thin sheets with ragged outlines; like the specimens in Case E 6.

Mica does not occur *in situ* in the State of Ohio, but is supposed to have been obtained from the southern heights of the Alleghanies.

Traces of spun thread and woven cloth were observed in Mound No. 9, "Clark's Work."

OBJECTS FOUND IN MOUND c—e, LIBERTY TOWNSHIP, ROSS COUNTY, OHIO.

A 51.

No. 11 is a thin plate of copper, about eight inches in

length and four in breadth, perforated with two holes. This is one of the so-called "gorgets." These ornaments are frequently found, but usually with inhumed burials. Copper "gorgets" are generally about the thickness of ordinary sheet copper, and are usually perforated with two holes, placed at equal distances from the ends, and somewhat above the longitudinal centre. This circumstance, and the fact that they are almost always found with skeletons, has led to the idea that they were personal ornaments, perhaps worn suspended around the neck, resting upon the breast. There is one circumstance, however, that seems inconsistent with this conclusion, namely, that none of the holes exhibit the slightest elongation from wear. On the contrary, their edges are as sharp as if newly cut. Such would scarcely have been the case with articles of this soft material, and of such thinness, had they been suspended in the manner suggested. The holes in the little silver crosses, found in the graves of the modern Indians, are frequently worn so much as to be nearly a fourth of an inch in length; and yet they weigh less than half an ounce, and are cut out of thicker plates of metal than the copper "gorgets." Either the "gorgets," if used for the purpose suggested, were worn only on extraordinary occasions, or they were suspended in such a manner that there was an absence of friction at the holes.

Ribaulde, who visited the shores of Florida, in 1562, speaks of a chief who "had hanging about his neck a round plate of red copper well polished, with one other lesser one of silver in the midst of it, and at his ear a little plate of copper, wherewith they used to stripe the swete from theyer bodyes." Sir Walter Raleigh mentions that the tribes with which he held communication on the shores of North Carolina wore copper plates on their heads, which were badges of authority, and distinguished the chiefs. These plates were so highly polished that they were at first mistaken for gold. It is not impossible that the specimens found in the mounds were worn in a like manner by the ancient people. No. 11 was found beneath the head of the skeleton with which it was buried. Associated with it was the pipe, No. 12. The tool marks are plainly to be seen upon this specimen.

No. 15, Case C 38, is a "gorget," consisting of a thin plate of hammered copper, with one hole near the centre; it was found in a mound near "Clark's Work."

OBJECTS FOUND IN MOUND NO. 1, PLATE 2, "ANCIENT
MONUMENTS OF THE MISSISSIPPI VALLEY."

In this mound a number of canine teeth of animals drilled for suspension were found. Such specimens can be seen upon Tablets 8 to 11, Case B 34, all of which were obtained from the mounds opened by Squier and Davis. Among them are teeth of the wild cat, wolf, and bear.

Some modern necklaces of canine teeth are shown, in Cases D 4 and D 5, for illustration.

In "Mound No. 1, Plate 2," a number of shell and bone beads were also found, such as those upon Tablets 26 and 28, Case B 34.

OBJECTS FOUND IN MOUND NO. 3, PLATE 2, "ANCIENT
MONUMENTS MISSISSIPPI VALLEY."

A 50.

No. 6 is the only wedge-shaped stone hatchet, obtained by Squier and Davis from either of the mounds of Ohio, which the discoverers consider can be assigned to the period of the mound-builders. The present writer has expressed an opinion that No. 6 is probably not of the period of the mound-builders.*

GRAVE CREEK MOUND.

A 50.

Nos. 33 and 34 are casts of the upper and under surface of the celebrated "Grave Creek" Tablet, said to have been found under the circumstances already mentioned.

Mr. Schoolcraft, who has especially studied this relic, finally concludes, after corresponding with many American and European archæologists, that of the twenty-two letters upon the tablet, four resemble ancient Greek characters, four are like Etruscan, five like the old Northern Runes, six like ancient

* See page 105.

Gaelic, seven resemble old Erse, ten are like Phœnician, fourteen like Anglo-Saxon, and sixteen like Celtiberic; besides which, other equivalents may possibly be found in old Hebrew. A stone of such doubtful character could prove little under any circumstances; but it must also be mentioned, that Dr. James W. Clemens communicated to Dr. Morton all the details of the exploration of the Grave Creek Mound, without making any reference to the discovery of the inscribed stone. Nor was it until the objects obtained from this Mound were exhibited by the proprietor to all who cared to pay for seeing them, that the marvellous inscription came opportunely to light to add to the attractions of the show.

B 34.

Upon Tablets 1 to 3 are shells pierced for suspension. Upon Tablets 4 to 7, and 26 to 28, are shell-beads. The specimens *b*, *c*, *d*, and *e*, Tablet 1, are shells of the *Dentalium*. These shells and shell-beads have all been found in various tumuli in Ohio. Sea-shells in their natural state, or made into beads, were highly valued by most of the North American Indian tribes, and were frequently worn by them as amulets. The *Venus mercenaria* was thus prized, and various articles of ornament, having a sacred import, were made from these shells. It was perhaps on account of their value as amulets that marine shells and shell-beads were so frequently buried in the tumuli; for the Indian futurity is not a place of rest, and the hunter's soul during its uneasy wanderings has still occasion for the protecting power of the charm. Marine shells, of the genera *Marginella*, *Oliva*, and *Natica*, pierced for suspension, have been found in many of the American mounds. Shell-beads have been found in mounds in Western New York; on the plains of Sandusky, near Buffalo, and north of the Niagara river in Canada.

The shells found in the Grave Creek Mound are all of one species of *Marginella*, which is found on the coast of Florida and in the West Indies.

Shell-beads, moreover, under the name of *wampum*, represented the first aboriginal idea of an arbitrary standard of value among the North American Indians.

Perhaps no shell has been more prized by the American Indians than that of the *Dentalium*.

Upon Tablet 1, *b*, *c*, *d*, and *e*, are specimens of this shell found in the Ohio mounds. These were probably obtained by barter from the tribes on the north-west coast, and indeed may have passed from tribe to tribe at an enhanced value in proportion to the distance they were carried from their original habitat. These shells are still highly valued by the Indian tribes on both sides of the Rocky Mountains. In Case D 6, upon Tablet 11, is part of a necklace of *Dentalia*, which was taken from the body of *Shaw-hön-taen*, or *Dull Knife*, the great medicine man of the Cheyenne Indians, who was killed at Forsyth's fight, on the dry fork of the Republican river, between Fort Sedgwick and Fort Hayes, Kansas, 17th to 28th September, 1868.

A 49.

No. 1 is a tube of whetslate, found in a mound close to Chillicothe, the interment in which had been by cremation. The tube is thirteen inches in length, by one and one-tenth in diameter; one end swells slightly, and the other terminates in a broad, flattened, triangular "mouth-piece." It is drilled throughout; the bore is seven-tenths of an inch in diameter at the cylindrical end of the tube, and retains that size until it reaches the point of union with the mouth-piece, when it contracts gradually to one-tenth of an inch at the end. The inner surface of the tube is perfectly smooth, till within a short distance of the point of contraction. For the remaining distance the circular striæ, formed by the drill in boring, are distinctly marked. One end of the tube is slightly discoloured from the heat to which it had been exposed.

Nos. 2 to 3 are parts of lime-stone tubes. No. 2 was found in a burial-mound, near Chillicothe. No. 4 is part of a tube of whetslate. Several stone tubes similar to No. 1 were found in some tumuli, near the celebrated Grave Creek Mound. A quarry of whetslate occurs on the banks of Grave Creek, about four or five miles above the great mound.

It is difficult to assign a purpose to these stone tubes. Vanegas says that the "medicine men" of the Californian Indians use tubes of stone in the cure of diseases. "They applied to the suffering part of the patient's body the *chacuaco*, a tube formed out of very hard black stone, and through this they sometimes sucked, and at other times blew, but both as hard as

they were able, supposing that the disease was either exhaled or dispersed."

A 49.

Nos. 14 to 33* are stone "gorgets." Nos. 17, 29, and 32 are from Alabama. The locality of No. 26 was not given; the remainder are from Ohio.

It will be observed that the perforations in the "gorgets" have been made, in some instances, with a tool made upon the principle of a modern centre-bit; for the drilling was effected by a central point, which did not project from the base of the tool more than a quarter, or from that to three-eighths of an inch; as may be seen from the circular striæ left by the base of the tool when the point had penetrated to this depth. Judging from the marks upon No. 14, this base of the tool had a diameter of about seven-eighths of an inch. The Swiss lake-dwellers appear to have employed, in some instances, a similar form of drill. The holes in the gorgets are bevelled from one or both surfaces, and at the narrowest part are seldom more than one-eighth of an inch in diameter. The circular striæ left by the tool are to be seen in nearly every specimen.

"Gorgets" found in the Ohio mounds have been chiefly associated with inhumed burials. The specimen upon Tablet 26, Case C 37, is, however, an exception.

These "gorgets" may have been worn suspended round the neck, resting upon the breast. It is remarkable, however, that none of the holes, as has been already mentioned,† show elongation from wear, and the greater part of the "gorgets" have been found by the side of the skeleton, near the bones of the hand, which does not accord with the idea of their use as neck ornaments. A stone gorget in Dr. Hildreth's collection, obtained from a mound near Chillicothe, is said to have been found resting upon the breast of a human skeleton.

Schoolcraft has suggested that the "gorgets" were used in

* The "gorgets" are of the following materials:—Nos. 14 to 16, and 23, rather soft slate; No. 17, ferruginous claystone; Nos. 18, 26, 27, 30, whetstone; No. 26 is characteristic as to hardness, and contains a high percentage of silica; No. 19, slightly micaceous sandstone; Nos. 20, 33, clay slate; Nos. 21, 22, 31, slate; No. 24, sandstone; No. 25, limestone; No. 28, coral; Nos. 29 and 32, micaceous slate.

† See page 123.

the manner of a rope-maker's reed for twisting fibres in making twine, but the entire absence of wear inside the holes appears to be fatal to this idea. For the same reason the notion that they were used for condensing raw hide or sinews for bow-strings, in a manner analogous to wire drawing, cannot be entertained.

Schoolcraft remarks that these objects may have been "one of the forms of those ancient badges of authority, to which, as a generic term, the modern Algonquins apply the name *Na-be-kow-á-gun*. The native tribes, from our first acquaintance with them, evinced their fondness for insignia of this kind. The modern medal is the result of a compliance on our part with this passion."

"Gorget" have been met with in the States of Virginia, Ohio, Kentucky, Tennessee, Illinois, and Indiana. Ornaments resembling the gorgets, made of shell, are described as having been worn by the "priests" of some of the southern tribes of Indians, and by the Indians of Virginia.

No. 34 is a fragment of drilled clay slate from Ohio. No. 35 is a piece of worked clay slate, perhaps part of a gorget, found in Ohio.

B 32.

Upon Tablets 25 to 32 are some flint flakes, and arrow- and spear-heads, found upon the surface, or at an inconsiderable depth, in Mound No. 3, "Mound City." Some of these, such as *c*, upon Tablet 29, have been exposed to the action of fire. It is probable that these specimens are relics of the mound-builders. They are all of the triangular form; not a single barbed specimen occurs among them.

B 33.

The bone tube, upon Tablet 1; the pieces of carved bone, upon Tablets 2 to 4; the fossil shark's teeth, upon Tablets 5 and 6; the reptilian teeth, upon Tablets 7 to 10; the terra-cotta tablets, upon Tablet 11; the discoïdal stones, upon Tablets 12 to 13; and the pieces of worked stone, upon Tablets 14 to 18, are noticed at pages 118—120. The pearl beads, on Tablet No. 19, are much calcined. Great quantities of pearl beads were found in the "altar" mounds, but they were in such a frail state that few could be removed. The bone implements upon Tablet

20 are noticed at page 122. Upon Tablet 21 is a piece of burnt clay with a few charred threads attached to it, found in a burial mound, Ross county, Ohio. The obsidian spear-heads, upon Tablets 22 to 26, and the mica scrolls and circles, upon Tablets 27 to 32, are noticed at page 122.

B 34.

The shells and shell-beads, upon Tablets 1 to 7, and 26 to 28, are noticed at pages 125 and 126. Upon Tablets 8 to 11 are teeth of animals, drilled for suspension, among which are canines of the wild cat, wolf, and bear; and teeth of alligators.

Upon Tablet 12 are bears' claws, drilled for suspension. These were probably strung and worn as a necklace, in a similar way to the necklace No. 7, Case D 6, from the north-west coast of America, which was presented to the Collection by Sir Edward Poore, Bart. A necklace of the claws of the grizzly, or black, bear was supposed to impart to the wearer some of the courage and ferocity of the animal; it was an amulet as well as an ornament. The Shoshonees prefer a necklace made of bears' claws to any other.

Upon Tablet 13 are portions of a bone ring, with drilled holes at the sides; it is stained by having remained in contact with some copper object. Upon Tablet 14 is a piece of carbonised woven cloth, found in a mound in Butler county, Ohio. Very few remains of spun thread or of woven fabrics have been recovered from the mounds.

The bone implements upon Tablets 15 to 25 are noticed at page 110.

C 38.

The copper "gorget," upon Tablet 15, is noticed at page 123.

The copper armlets, upon Tablets 16 to 18, and 20, are noticed at page 118.

The piece of clay, upon Tablet 19, and the galena, upon Tablets 20 and 21, are noticed at page 112.

The specimen, upon Tablet 22, is noticed at page 105.

C 39.

Upon Tablet 13 are two lumps of native copper. The

mound-builders appear to have worked copper only in its cold state, and they probably obtained their supply from the shores of Lake Superior, as it contains silver in a similar way to the ore of that district. The specimen of native copper, *b*, upon Tablet 13, is from the district of Lake Superior, and crystals of silver may be noticed on it. According to Professor Wilson, the Lake Superior copper contains on an average 3.10 per cent. of silver. Native copper is highly malleable, and the mound-builders appear merely to have treated it as a *stone*, which possessed certain peculiar and valuable properties. It could be wrought to an edge or point without liability to fracture, and its malleability enabled it to be hammered into many new and convenient shapes. All this was effected without the use of the melting-pot, and probably without the knowledge that copper could be reduced by heat, and cast at once in any desired form.

C 39.

Upon Tablet 14 *a* to *g* are pieces of copper ornaments, found on the mound "altars;" they are all much injured by fire. Upon Tablet 14 *h* is a piece of plate copper, which may have formed part of the covering of the base of a stone smoking-pipe, like the specimen *d*, upon Tablet 19. Upon Tablet 15, *a* to *j*, are pieces of plate copper, which have perhaps been used for covering stone smoking-pipes. Upon Tablet 16, *a* to *h*, are other pieces of thin copper; *b*, *c*, *d*, and *e* may have been used for covering pipes; *f*, *g*, and *h* are parts of personal ornaments. Like the other mound objects, they are much injured by fire; *a* may have served as an ornamental band for the base of a smoking-pipe.

Upon Tablet 17, *a* to *f*, are remains of personal ornaments of copper, molten from the heat to which they have been exposed. Upon Tablet 18, *a* is a copper ring; *b* to *f* are copper beads, made of two plates of thin copper, united at the edges by hammering. They are flat on one surface and convex on the other. Some of these objects are perforated with holes, through which thread may have been passed to attach them to the dress or the person.

Upon Tablet 19, *a* to *c* are pieces of molten copper, from the mound "altars." Upon Tablet 19 *d* is part of the base of a stone smoking-pipe, covered with sheet copper, which has been beaten over at the sides; *e*, upon the same Tablet, is part of the base of a stone smoking-pipe, with a tube of

copper inserted in the hole. This tube still projects about an eighth of an inch beyond the end of the pipe, and it is probable that the lips were applied to such a tube in smoking this variety of pipe. The absence of stain from copper within and around the holes in the mound pipes, would lead to the supposition that a quill or straw may have been generally used; as, indeed, is the case with the Indians of the north-west coast in smoking such pipes as Nos. 26 to 33, Case E 5. The mound pipe, No. 4, Case C 34, however, is very much stained at the hole, and was probably used with an inserted tube of copper.

Upon Tablet 20 is a wedge-shaped copper hatchet, apparently cast; it has not been exposed to the action of fire since it was cast, and it does not resemble the other copper objects taken from the "altars" in condition. Probably it should not be regarded as a relic of the mound-builders.

Upon Tablets 21 and 22 are some bronze and copper objects, from Peru, for comparison.

D 19.

Upon Tablet 6 are fragments of one of the mound "altars" of burnt clay.

Upon Tablet 7 are pieces of galena.

Upon Tablets 11 to 13 are fragments of marine shells.

Upon Tablets 14 and 15 are fragments of fresh-water shells.

Upon Tablets 16 to 19 are pieces of elk's antler, noticed at page 110.*

Upon Tablets 20 and 21, in box No. 27, and in glass dishes, Nos. 28, 29, and 31 are burnt human and animal bones, from the "altar" mounds.

In the glass dishes Nos. 25 and 32 are human and animal bones, from the burial mounds.

In the glass dishes Nos. 23, 24, 26, and 33 are fragments of stone smoking-pipes, much calcined.

In the glass dish No. 22 are burnt reptilian bones and cetacean teeth.

No. 30 is part of a block of ferruginous sandstone, found in one of the Ohio mounds. It has been broken off from

* Upon looking to page 110, I find that the material, through an oversight, is termed *red-deer's*, instead of elk's, antler. The red deer (*Cervus elaphus*) is not found in America.—E. T. S.

the much larger mass figured by Squier and Davis, which originally weighed between thirty and forty pounds. The surface of this stone was pitted with cup-shaped depressions. The oblong fragment in the Blackmore Collection measures six inches by eight, and has upon it three perfect detached cups, two cups which are confluent, portions of three finished cups, one half finished, and several which have been commenced. It may be well to remark that these "cups" are *oval*, there being a difference in the two diameters of about one-eighth of an inch. They measure in their greater diameter about one inch and a half, and are about seven-eighths of an inch in depth. Judging from the engraving in the "Ancient Monuments of the Mississippi Valley," the cups upon the original mass were not all of the same size. One corner of the fragment, No. 30, indicates that it has been exposed to the action of fire. Squier and Davis have suggested that these cups were used in hammering plates of copper into the convex form needed for making bosses, such as those shown in Case E 6, upon Tablets 2 and 3. The circumstances that two of the cups are confluent, that the surface of the block has not been smoothed, and that there is no evidence of bruising from hammering, all militate against the idea that this block was used, or was even intended to be used, as an anvil.

On the other hand, "cup-cuttings" closely resembling those upon this block have been found in the British Isles, Scandinavia, the Channel Islands, Brittany and Switzerland.

"The simplest type of these ancient stone and rock cuttings consists of incised hollowed-out depressions or cups, varying from an inch to three inches or more in diameter. For the most part these "cup-cuttings" are shallow. Consequently their depth is usually far less than their diameter; it is often not more than half an inch, and rarely exceeds an inch or an inch and a half. On the same stone or rock surface they are commonly carved out of many different sizes. . . . The simple "cup-cuttings" are generally scattered singly, and apparently quite irregularly, over the surface of the stone; but occasionally they seem placed in groups of four, six, or more."

The "cup-cuttings" upon the Ohio block are not the only American examples which have been observed, although hitherto the resemblance between these singular sculptures in the old and the new world appears to have been unnoticed. Lord Kingsborough has figured a rocking-stone, described as being

situated in the middle of a large plain, near Orizaba, upon the surface of which (as shown in the plate) there are fourteen "cup-cuttings." The description given of this stone is as follows:—"It is spherical in its form, very hard, and of a dark blue colour. It has evidently been wrought into its present shape, and placed in the middle of a spacious plain, by the ancient inhabitants of the country. It is so artfully balanced on its axis as to revolve at the slightest touch of the finger; but if a greater force be used it will stand without the least apparent motion. Its surface contains some holes capable of holding a small quantity of water. It appears to have anciently served as a landmark. There is another of these stones to the east, about six miles distant." The "cup-cuttings" seem to be scattered irregularly over the surfaces of this stone.

Rude consecrated stones (*menhirs*) are to be seen in the Fiji Islands, to which offerings of food are sometimes made. Two of these Fijian *menhirs* are figured, one with a *liku* tied round the middle, and the other ornamented with, what seem to be, three "cup-cuttings" surrounded with concentric circles.

"Cup-cuttings" appear never to have been associated with any form, however rude and primitive, of letter-cutting or letter-writing.

"Cup-cuttings" have been discovered along the *whole length* of the British Isles, from Cornwall and Dorsetshire in the South, to Orkney in the far north; and across their *whole breadth*, from Yorkshire and Northumberland on the eastern coast of England, to Kerry on the western coast of Ireland. At these distant and diverse points, and in the mainland districts between them, they everywhere present a sameness of type and form. Should the American "cup-cuttings" prove to be of the same nature and character as those found in Europe the interest of the whole question will be greatly increased.

E 6.

The vessel No. 1, and the copper bosses upon Tablets 2 and 3, are noticed at page 110.

Upon Tablets 4 to 10, 16 and 17, and in Dishes 20 to 22, are fragments of pottery found in the mounds.

In the glass dishes 11, 18, and 19 are fragments of calcined stone smoking-pipes.

The smoking-pipes Nos. 12 and 13 are noticed at page 118.

Upon Tablets 14 and 15 are fragments of mound "altars" of burnt clay.

The two copper wedge-shaped hatchets, Nos. 23 and 29, were found near the surface of Mound No. 7, "Mound City," and perhaps belong to a secondary interment.

The plates of mica, No. 24, are noticed at page 99.

The two shells Nos. 25 and 26 are noticed at page 121.

The two vessels No. 27 and No. 28 belong to secondary interments. No. 28 is noticed at page 112.

E 9.

In the glass dish 1 are fragments of a stone pipe, perhaps intended to be smoked with a tube.

In the glass dish 2 are fragments of calcined stone smoking-pipes.

In the glass dishes 10 and 11 are fragments of pottery found in a tumulus near Fort Wadsworth, Dahcota country.

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It is probable that some relics of the mound-builders may be included with the objects about to be described, none of which, however, were actually exhumed from the mounds.

A 48.

No. 1.—A ball of greenstone, found in Ohio.

No. 2.—Ball of syenite, Ohio.

No. 3.—Ball of greenstone, Ohio.

No. 4.—Ball of quartzose rock, Ohio. A stone ball, resembling the specimens in this case, found in New Mexico, is shown in Case A 42, No. 10. Probably, some of these stone balls may have served for weapons, wrapped in leather, and mounted at the end of a stick.

No. 5 is a ball of chert, flattened on the under side. It was found in Ohio, and is bruised upon the surface like the flint balls met with in England, supposed to have served as hammer-stones. See No. 3, Case A 20, found at Icklingham; and several examples from Bridlington, in Case A 21. No. 6 is a ball of greenstone, with a groove worked around the centre, Ohio.

No. 7 is a ball of limestone, grooved like No. 6, Florida. No. 8 is a grooved quartzite hammer-stone. Probably these implements were hafted by passing a withe around the groove. Country blacksmiths and plate-layers on railroads still haft their hammers in this manner. A modern iron hammer, mounted in a withe, may be seen in Case C 42, No. 34.

No. 9 is an egg-shaped object of limestone, Ohio. No. 10 is a conoid-shaped object of mica slate, Ohio. No. 11 is a similar object to No. 10, made of ferruginous rock, containing quartz, &c., Ohio. No. 12 is an object similar in form to Nos. 10 and 11, but more carefully finished than they are, and made of hæmatite, Ohio. These objects are classed by Dr. Davis as mullers for grinding paint. Neither of the three specimens, Nos. 9 to 11, are worn on the under surface, so that if intended for mullers they have not been used. No. 13 is a ball of hæmatite, with the under side flattened, Ohio. This specimen may have been used as a muller; the under surface has been considerably worn, and if the mass was rubbed down with water, the muller itself would have furnished a red paint for the decoration of the person or weapons. Pieces of hæmatite, supposed to have been used for paint, have been met with in the caves of France, Tablet 8, Case B 13, and in the Swiss lake-settlements, Tablet 31, Case B 27. No. 14 is a similar object of hæmatite to No. 13, Ohio; this specimen shows wear upon the under surface. No. 15 is an irregularly-shaped mass of hæmatite, exhibiting traces of rubbing at various parts, perhaps produced in preparing red paint; it was found in Ohio.

No. 16 is a geode of impure red hæmatite of oval form, with similarly shaped sandstone core; the natural form of this object possibly suggested its use as a plummet, Ohio. No. 17 is part of a plummet-like object of gneissoid rock, Ohio. No. 18 is a similar object to No. 17, made of limestone, Virginia. No. 19 is a portion of a similar object, with worked knob at one end; it is made of gneissoid rock, Virginia. No. 20 is a similar object of limestone, Florida. No. 21 is a plummet-like object of hæmatite, grooved at the lesser end, Ohio. No. 22 is a plummet-like object of talc, grooved at one end, and with the other end worked to a corresponding blunt point, Ohio. No. 23 is a fusiform object of quartzose rock, grooved at one end like Nos. 21 and 22. This specimen has a projecting ridge carried round the middle, and is ornamented with lines of red paint. The straight side shown in the figure is flattened. No. 24, object of highly ferruginous mica schist (?), Ohio. No. 25,

object of hæmatite, of a double conoid form, with a groove worked round the middle, Ohio. These pendants, according to Squier and Davis, are of frequent occurrence in the vicinity of the ancient earthworks, but have seldom been found in the mounds themselves, and, even when so found, probably belong to a secondary interment. No. 22 is of the more usual type; the original measures three inches and a half in length by an inch and a quarter in its greatest diameter; and weighs about four ounces. The use of these plummets as net-sinkers and as ear ornaments has been suggested; they are probably too carefully finished to have been used for the former purpose, and too heavy to admit of their being applied to the latter use. Schoolcraft, however, has figured a fisherman's stone-sinker in use among the Pennakook Indians, New Hampshire, which closely resembles No. 21 in form; it measures three inches and one-eighth in length, and its greatest diameter is one inch and three-eighths.

Nos. 26 to 28 are discoïdal stones, hollowed on both sides, and having a central perforation. No. 26 is of quartzose rock; when perfect it must have measured about four inches in diameter; it is two inches and a quarter in thickness, and was found in Ohio. It is the most highly finished of the three specimens in the Collection. No. 27 is of greenstone; it measures three inches and seven-eighths in diameter, and is two inches in thickness, Ohio. No. 28 is of quartzose rock; it measures two inches and three-quarters in diameter, and is an inch and a quarter in thickness. Objects similar to these specimens have been found in different parts of the continent of America, from the valley of the Ohio to Peru. They are of various sizes, ranging from two to six inches in diameter, and are usually worked with great symmetry, and well polished. None of these objects were found in either of the mounds examined by Squier and Davis; but Schoolcraft mentions the discovery of two, in one of the minor mounds on the Grave Creek Flats, Ohio. One of these specimens is three inches and three-fifths in diameter, the other is only one inch and three-tenths; both are said to be of yellow porphyry. On the Ohio and along the Gulf, such stones were in common use for playing certain favourite games. Beyond the Mississippi this use of them is still retained.

Schoolcraft suggests that these ancient specimens were used as quoits, and that the object in hurling them was to cover an upright peg, driven into the ground.

Discoïdal stones, resembling those shown in the Blackmore Collection, are found in abundance in Chili, some of which may have been used for arming clubs. "In the plains and upon the mountains," says Molina, "are to be seen a great number of flat circular stones, of five or six inches in diameter, with a hole through the middle. These stones, which are either of granite or porphyry, have doubtless received this form by artificial means, and I am induced to believe that they were the clubs or maces of the ancient Chilians, and that the holes were perforated to receive the handles."

No. 29 is a disc of felstone, found in Ohio, with a central depression upon the two surfaces; these depressions have been made by "pecking;" the tool-marks are plainly to be seen. This specimen resembles No. 30, Case A 26, which was found on the bank of the river Bann, Ireland. The sides of the American disc are rather more straight than those of the Irish specimen. No. 30 is a drilled object of trachyte, found in Missouri; it is of the form usually called a "net-sinker." Similar specimens, from Ireland, are shown in Case A 26. No. 31 is a "spindle-whorl" of fine-grained trachyte, Ohio. No. 32 is a sandstone disc, found in Ohio, ornamented on the two surfaces with an incised cross, inscribed within a circle; this object is probably rather modern. No. 33 is a piece of whetslate, which appears to have formed part of a whetstone, Ohio. No. 34 is a piece of whetslate, which illustrates the mode adopted in working the material; it was sawn partly through from each side, and then fractured along the weakened line. No. 35 is of whetslate, marked upon its upper convex edge with twenty-eight notches. The length of this object is five inches and a half; its greatest breadth is one inch and a half; it was found in Ohio.

A 49.

The stone tubes, Nos. 1 to 4, are described at page 126.

Nos. 5 to 12* are drilled stone axes, probably used as weapons of parade; the material is too soft for any useful purpose, and the haft-holes are so small that the handles would be very liable to break. No. 6 is from Massachusetts; the other specimens are from Ohio.

* Nos. 5 and 10 are of clay slate; No. 6 of felspathic greenstone; Nos. 7, 8, 9, 11, 12, of whetslate. The material of No. 10 closely approaches whetslate.

No. 5 and No. 6 appear to be unfinished; the drilled hole has been commenced on one side of No. 5, and on both sides of No. 6. The circular striæ are to be seen inside the holes in both specimens; a hollow tool was not used in making the perforations, for the bottom of each hole is rounded; perhaps hollow drills were used in perforating Nos. 7, 9, 10, 11, and 12.

In North America the grooved tomahawk was, prior to the occupation by Europeans, the prevailing implement of the axe kind. American drilled axes are uncommon. They are usually small, and, as before mentioned, were probably used as weapons of parade. The haft-holes are exceedingly regular, and the annular striæ can often be plainly seen.

No. 13 is a flat axe or hoe of fine-grained greenstone (aphanite), with a small drilled hole.

The stone "gorgets," Nos. 14 to 33, and the specimens, Nos. 34 and 35, in this Case, are noticed at pages 127 and 128.

A 50.

No. 1 is a carved object of whetslate, **A**,* of bird-like form, found in Ohio. No. 2 is a similar object, of green chlorite, found in Virginia. No. 3 is another example, made of whetslate, found in Ohio. In point of size these specimens are nearly alike, being about five inches and a quarter in length, with an average breadth of about three-quarters of an inch. Very many examples of these objects have been met with in the States of Virginia, Ohio, Kentucky, Tennessee, Illinois, and Indiana. They are frequently made of the variety of slate (whetslate) mentioned at page 106. They have holes perforated diagonally at the lower corners; these holes usually show wear from friction. Squier and Davis consider that these objects have been worn as amulets, or as badges of distinction. Schoolcraft classes them as knife-handles, "designed to confine the cutting edges of flinty or obsidian blades."

No. 4 is a pipe-bowl of green chlorite, in the form of an owl, found in Virginia.

No. 5, **B** var., † was found within an ancient enclosure, twelve miles below the city of Chillicothe. It is a smoking-pipe; the bowl rises from the centre of the back of a human-headed bird, and communicates with a hole drilled at the side for the inser-

* See page 106.

† See page 107.

tion of a stem. It measures four inches and three-quarters in length. Squier and Davis consider that this object is a relic of the mound-builders; but it does not appear that any pipe of similar form, or indeed *any* pipe intended to be smoked by means of an inserted stem, has been found in either of the Ohio mounds.

The stone hatchet, No. 6, is noticed at pages 105 and 124.

The stone smoking-pipe, No. 7, is noticed at page 123.

No. 8 is a smoking-pipe of green chlorite. A similar pipe, which formed part of the Klemm Collection, is preserved in the Christy Museum. No. 9 is a smoking-pipe (?) of green chlorite, found in Virginia. It is either unfinished, or was not intended for the use suggested; the stem is not drilled, and there is a hole near the bottom of the bowl, which does not communicate with the supposed tube. In form this object somewhat resembles the ordinary European clay pipes. No. 10 is a white granite pipe-bowl, intended to be used with a tube; it was ploughed up near Paint Creek, Ohio, in the vicinity of one of the large "enclosures;" but it probably cannot be classed as a relic of the mound-builders. This specimen is much weather-worn. No. 11 is a pipe-bowl of burnt clay, found in a mound in Mississippi; it is probable that both Nos. 11 and 12 were associated with secondary interments; they were each intended to be used with a tube. No. 12 is a pipe-bowl of burnt clay, found in a mound in Alabama.

No. 13 is a pipe-bowl of quartz rock, of an egg-shaped form, found in Ohio. No. 14 is a pipe-bowl of coral, of similar shape to No. 13. Nos. 13 and 14 were each intended to be used with a tube.

A 50.

No. 15, C *, is in the form of an animal's head, possibly intended for that of the elk. This object is completely hollowed out on the under side, leaving a thin shell of material, about one-tenth of an inch in thickness. There are small holes drilled at the root of each ear, and another hole is drilled from the interior through the crown of the head. It was found in Ohio.

* This letter (C) refers to the classification of materials proposed by Professor Church, at page 108.

A 50.

No. 19, **C**, is part of a ring carved with great accuracy, and highly polished; found in Ohio. These rings usually measure about two inches and three-quarters in diameter, and are about half an inch in thickness. They are deeply grooved upon the outer edge, and are pierced by eight small holes, at equal distances from each other, all converging to the centre. Several rings of rather larger dimensions were obtained, some years since, from a mound at Cincinnati. Similar rings, of smaller size, made of bone, have also been found. No. 20 is a cast representing No. 19 restored.

The perforations and hollows of the mound-pipes, and of some other objects, are drilled with extreme accuracy, showing that the tool used was not merely turned between the hands, but was moved by an arrangement probably resembling the "bow-drill" used by watchmakers and others. The ordinary "bow-drill" consists of a straight tool, which passes through the centre of a disc grooved on the outside, motion being imparted to the tool by means of a bow, the string of which is made to encircle the disc. It appears probable that a ring, such as No. 19, may have formed part of a drilling apparatus somewhat of this kind.

Nos. 16 to 18, 23 to 26, and 28 to 30, are fragments of stone smoking-pipes, from Mound No. 8, "Mound City," shown to illustrate the mode of drilling practised by the mound-builders.*

No. 21 is a thin tablet of clay slate, one inch and seven-eighths in length, one inch and a quarter in width, and rather more than an eighth of an inch in thickness. It is perforated with five large and six small holes, and was found in Ohio.

No. 22 is also of clay slate; it was found in Ohio, and is pierced with seventeen holes. It measures two inches and seven-eighths in length; its greatest breadth is one inch, and it is of the same thickness as No. 21.† No. 27 is a piece of green chlorite, considered by Dr. Davis to be the roughly blocked out commencement of a smoking-pipe of the mound type. The tablets Nos. 31 and 32 are noticed at page 119; Nos. 33 and 34, at page 124; Nos. 35 to 37, at page 119. No.

* Nos. 16, 17, 28, and 29, are of limestone; Nos. 18 and 30 of **B**, see page 107; Nos. 23 and 24 of **B**, dark var.; Nos. 25 and 26 of **B**, light var.

† Professor Church has suggested that the tablets, Nos. 21 and 22, were used as gauges, or were in some way connected with working in thread.

38 is a limestone pipe, found near Lake Michigan, about the year 1846, by Mr. Thomas Parker, upon the site of an Indian (Winnebago?) encampment, in the township of Caledonia, Racine county, Wisconsin. It was presented to the Collection by Mr. G. Wing.

No. 39 are pieces of molten copper, taken from the "altars" of the Ohio mounds.

No. 40 are pieces of galena from the "altars."

"CALUMET IDOLS."

H 14.

Pipes such as those upon Case H 14 have been termed "Calumet Idols" by Dr. Davis; being of too large a size for common use, they were probably reserved for ceremonial purposes. No "Calumet Idols" have been found in either of the mounds of Ohio.

No. 1.—Cast of a "Calumet Idol" in the form of a bird. The original is made of a micaceous stone, or perhaps of *℄*.* It was found in Illinois, and is now in the museum at St. Louis. No. 2.—Cast of a "Calumet Idol," in the shape of a bird with the wings slightly extended. The original is of greenstone, and was ploughed up in Tennessee. No. 3 is a "Calumet Idol" of chlorite, *℄*, in the form of an animal, and was found in Ross county, Ohio. It measures eleven inches and three-quarters in length, and is three inches in height at the bowl. In working out the bowl a tool with a sharp point has been used. No. 4.—"Calumet Idol," of slightly ferruginous sandstone, found near Paint Creek, Ross county, Ohio. It is five inches and a half in length, and about five inches in height. A snake is folded round the neck of the figure. The head of the figure is surmounted by a knob, like the scalp-lock of the Indians. Incised markings are to be noticed upon the face, somewhat resembling the markings on the faces of the heads sculptured upon the pipes Nos. 9 and 10, Case C 39.

No. 5.—Cast of stone "Calumet Idol," in the form of a frog. The original was found in Indiana, and is preserved in the collection of Dr. Locke, of Cincinnati. No. 6.—Cast of a light-coloured sandstone "Calumet Idol," representing a human figure resting upon its knees and elbows. The original is

* See page 108.

preserved in the collection of Mr. J. Van Cleve, Dayton, Ohio; it was found in digging a mill-race, three feet below the surface, on the west bank of the Miami river, near the village of Tippecanoe, Miami county, Ohio. It measures six inches in length, and is about six inches in height.

A 50.

No. 7 is part of a "Calumet Idol," representing the head of some animal. Like No. 3, Case H 14, it is of chlorite, \mathcal{C} . It was found to the north-east of Paint Creek, Ross county, Ohio; the fragment measures seven inches and a half in length. The circular striæ left by the drill are to be seen in the tube; at the end of the bore there is a core still attached, which shows that the drilling was effected with a hollow tool. The bowl appears to have been excavated with a pointed implement, as in the case of the pipe No. 3, Case H 14.

E 5.

The modern pipes in this Case are shown for illustration. It will be observed that there is not a single pipe in the entire series of the form of the mound-pipes.

Most of the North American pipe-bowls in Case E 5 are made of the red pipe-stone of the Coteau des Prairies, and named, out of compliment to the well-known traveller, "Catlinite." No. 35 is an unworked piece of this stone. The bowls of Nos. 1, 2, 3, 5, 6, and 7, are also made of "Catlinite." No. 3 was the favourite pipe of the eloquent Keokuk, chief of the Sacs and Foxes, whose name occupies a conspicuous place in the Indian history of the North-west. Some of the North American stone pipe-bowls are ornamented with inlet metal work, such as Nos. 4, 7, and 16; sometimes metal was used for mending a broken pipe, as in the case of No. 9. A few North American pipe-bowls of other varieties of stone are shown, such as Nos. 8 and 15. No. 12 is a tomahawk pipe of black stone. No. 11 is the modern iron representative of this form of pipe. No. 36 is another example, said to be of French workmanship. The tomahawk has a perforated handle, the hole communicating with the pipe-bowl, which is opposite the blade of the weapon; it thus is capable of serving a double purpose. It is worn in the girdle, or is carried behind the back, except in actual battle. The Indian uses it in close quarters with deadly effect, and also throws it with unerring

certainty at distant objects, making it revolve in the air in its flight. With the Indian the tomahawk is the emblem of war itself. To bury it, is peace; to raise it, is to declare war. During the American war the English were compelled to make iron tomahawks after the native pattern, with a pipe-bowl opposite the blade of the weapon, before the Indians could be efficiently armed as allies.

Nos. 26 to 33 are pipes made by the Babeens, and the Indians of Vancouver's and Queen Charlotte's Islands. No. 33 was found in the Mississippi. Nos. 26 and 27 are from Queen Charlotte's Island, and were presented to the Collection by Mrs. Nutt. No. 21 is a wooden pipe carved in the form of a fish, with an iron receptacle for tobacco. This kind of pipe is in use by the Koloshians, who inhabit from 54° 40' to Prince William's Sound. No. 21 was presented to the Collection by Captain Oliver Eldridge. No. 10 is a pipe-bowl of black stone from Otaheite. Nos. 17, 18, 22, 23, 24, 25 are stone pipes from Natal, Africa. No. 19 is a clay pipe from Africa, and No. 34 is a clay pipe from the East Indies.

STONE MAIZE-CRUSHERS.

H 13.

Nos. 1 to 10 are stone pestles from Ohio.* No. 11 is a ferruginous sandstone pestle, from Virginia. No. 12 is a pestle of porphyritic greenstone. No. 13 is a pestle of ferruginous sandstone. Nos. 12 and 13 were found in New Jersey. No. 14 is a pestle of greenish slate from Florida. Similar implements are in present use with the Indians for bruising maize. No stone pestles were found in the mounds examined by Squier and Davis.

C 33.

Nos. 1 and 3 are stone rolling-pins, found in Florida. Nos.

* The following are of porphyritic greenstone :—Nos. 1, 3, and 5. The following are of quartzite :—Nos. 2, 4, and 8. The following are of greenstone :—Nos. 6 and 7. No. 9 is of quartzose greenstone. No. 10 is of micaceous greenstone.

2 and 4 are stone rolling-pins, found at Warwick, Rhode Island, and presented to the Collection by the Hon. J. R. Bartlett. These objects resemble the corn-crushers, Nos. 6 to 9, Case H 12, from California; and No. 3, Case C 31, from St. Domingo.

STONE HATCHETS.

A 43.

Nos. 1 to 19* are wedge-shaped stone hatchets, all found in Ohio.

No. 1 is much blunted at the edge. Nos. 2 and 14 are flat on the under surface. Nos. 5 and 6 appear to have been bruised at the butt end, perhaps from blows given with a hammer-stone. No. 13 is thin, and has straight sides; it was probably used as an adze-blade.

The wedge-shaped stone hatchets met with in America present a considerable general resemblance to those found in Europe. Stone gouges are comparatively abundant in America. Stone hatchets and axes were not usually employed like the modern iron axes, for cutting down timber; this was chiefly effected by means of fire.

No. 20 is a thin plate of mica slate, in the form of a "gorget,"† measuring five inches in length, one inch and seven-eighths in breadth, and about three-eighths of an inch in thickness. It was classed by Dr. Davis with the stone chisels, but it has not a cutting edge. No. 21 is a rather thicker and less finished example than No. 20. It is of greenstone, and measures three inches and a quarter in length, one inch and five-eighths in width, and about seven-eighths of an inch in thickness. It is not easy to determine the intended use of these two objects (Nos. 20 and 21). Perhaps, however, they were used in preparing skins. Schoolcraft classes similar tools as "fleshing instruments." He says:—"It is a species of hand-chisel, blunt that it may not cut the

* The following hatchets are of greenstone:—Nos. 1, 4, 5, 6, 8, 11, 15, 16, and 19. The following are of felspathic greenstone:—Nos. 7, 9, 10, 12, 13, 17, and 18. The following are of felstone:—Nos. 2, 3, and 14.

† See pages 127—128.

skin, and yet of sufficient edge and hardness to permit a stout jerking blow. It was grasped firmly by the top. It was often very rude, and, indeed, was no more than an elongated stone, small, and brought to a blunt edge." This implement was used for removing the adhering flesh, &c., prior to currying the skins of animals killed in the chase.

A 44.

Nos. 1 and 6 are stone hatchets found in the United States. Nos. 2 to 5, and 7 to 14, are stone hatchets found in Ohio.* No. 7 has straight sides; Nos. 9, 10, and 14 are flat on the under side. No. 15 is a flint tool of the hatchet form, from Ohio. It is quite small, being only one inch and five-eighths in length, and one inch and a quarter in breadth; it is the only implement of flint of a hatchet shape in the Squier and Davis collection. Nos. 16 to 18 are small hatchets of hæmatite, from Ohio. No. 18 appears to be unfinished. Nos. 19 to 22† are stone chisels from Ohio. No. 20 is a fine and nicely-finished implement; it is ten inches and a quarter in length, and one inch and three-eighths in breadth. No. 22 is four inches in length, and an inch and a quarter in breadth. No. 21 is of a totally different form to the other chisels; it is five inches in length, the cutting edge being only half an inch; the butt-end is left broad and large, apparently to adapt it for use in the hand; at this part the tool is about an inch and one-eighth in diameter. No. 23 is a greenstone hatchet, from Ohio.

A 45.

No. 1 is a thin, lanceolate-shaped implement of chert. It measures about fourteen inches in length, five and a quarter in breadth, about three quarters of an inch in thickness, and is fashioned entirely by chipping. This kind of implement is

* The following hatchets are of greenstone:—Nos. 2, 5, 6, 7, 8, 11, 12, and 13. The following are of felspathic greenstone:—Nos. 3 and 4. The following are of felstone:—Nos. 9 and 14. No. 10 is of quartzose greenstone. No. 1 is of whetslate.

† Nos. 20 and 22 are of greenstone. No. 21 is of felspathic greenstone. No. 19 is of felstone.

thought, by Mr. Rau, to have been used for agricultural purposes.

No. 2 is a thin ovate implement of chert, pointed at both ends, and flattened on one surface; it is slightly rubbed (artificially) towards the middle on the more convex side. It measures eight inches and a half in length, its greatest breadth is two inches and three quarters, and it is three quarters of an inch in thickness. No. 3 is a chisel of greenstone. No. 4 is a greenstone hatchet of unusual form; it is flat on the under surface, and pointed at the butt end; it measures ten inches and three quarters in length, one inch and seven-eighths in breadth, and is one inch and a half in thickness. No. 5 is a hatchet of compact greenstone (aphanite); it is of the usual wedge-shaped form, and measures fourteen inches in length, three inches and a half in breadth, and two inches in thickness. No. 6 is a greenstone hatchet. No. 7 is a hatchet of felspathic greenstone. Nos. 1 to 7 are from various parts of the United States.

Nos. 8 and 9 are hatchets of compact greenstone (aphanite), from Virginia. Nos. 10 to 13 are stone hatchets from New Jersey.* No. 13 is unfinished. No. 14 is a stone hatchet from Maryland. No. 15 is a nicely-finished hatchet of felspathic greenstone, from Alabama; it measures nine inches in length. Nos. 16 and 17 are greenstone hatchets, from Florida. No. 18 is a hatchet-shaped implement of felspathic greenstone, from Missouri. The part usually brought to a cutting edge has, in this specimen, been *purposely* blunted, the surface being nearly half an inch in breadth. Marks of grinding are still to be seen upon this surface. No. 19 is a hatchet of hæmatite, from Warsaw, Illinois. Nos. 18 and 19 were shown in the Paris Exhibition, 1867.

Probably, many wedge-shaped stone hatchets were not intended to be hafted, but were for use in the hand. Loskiel, however, says of the Delawares:—"Their hatchets are wedges made of hard stones, six or seven inches in length, sharpened at the edge, *and attached* to a wooden handle." He adds:—"They are not used to fell trees, but only to peel them, and kill their enemies."

One way in which wedge-shaped stone hatchets were mounted may be seen from the portrait of "Black Elk," which is placed near Case A 43, and who is represented with one of these

* Nos. 10 and 12 are of felstone. No. 13 is of micaceous greenstone.

hafted implements in his hand. Other methods of mounting stone hatchets may be seen in Cases E 2 and C 40. Schoolcraft figures some hafted wedge-shaped stone hatchets, mounted at right angles to the handle, the handle measuring from twenty to twenty-seven inches in length. A stone implement, mounted as an adze, has also been figured by Schoolcraft.

Among the Spokain Indians, and some of the tribes west of the Rocky Mountains, according to Mr. Lord, stone hatchets are handed down from father to son as cherished heirlooms. Jade meris are similarly regarded as heirlooms by the New Zealanders, and are highly prized by them.

The use of stone hatchets does not appear to have been so general among the tribes west of the Rocky Mountains as among those who inhabited the country to the east of this range. "From a careful observation of the arts among the Aht natives," says Mr. Sproat, "I am tolerably certain that no other materials than bone and shell were required by them for making their tools and weapons up to the time when iron was brought amongst them, say, within the last 150 years. They used bone tools, and bone fishing and hunting instruments, long after they had a knowledge of iron—as lately, indeed, as a few years ago; and, at the present time, the mussel-shell adze, used in canoe-making, is preferred to one of any other material, and to the best English and American chisels. In felling large cedar-trees, and in other work, until the natives obtained the admirable American woodman's axe, they found their bone chisels more useful than any small-handled instruments of stone or iron; bone had the requisite toughness, bluntness, and penetrating power for working cedar-wood for their purposes. The Ahts, however, had a few stone and copper (the latter not melted or cast) implements, when they were first visited by Cook, and probably earlier, and ground stone chisels can be found amongst them at the present day. But I think that these stone implements could not have been in general use on the Aht coast, as the Indians never describe their utility, but produce old bone implements for every purpose on being asked what they used before they had iron."

The Aht hunters, prior to the introduction of iron among them, used a kind of thrusting sword, having a wooden handle, three feet in length, tipped with the shell of the mussel.

Lewis and Clarke tell us that the Indians on the Columbia split drift pine-wood with a wedge made of elk horn, driven by a mallet of stone curiously carved.

STONE AXES.

A 46.

Nos. 1 to 16* are grooved stone axes, all found in Ohio.

These axes appear to belong to two classes. The first, a mere boulder, or at most an artificially-rounded stone, with a groove worked at the sides, or around it near the middle. The other grooved axes are more carefully finished; one side is worked to a flat surface, probably that it might rest upon a corresponding flat piece of the handle; the groove is not carried round this flat side. These two classes of axes merge into each other. The flat side is well shown in No. 12. The hammer-end of many of the grooved axes shows wear. See Nos. 7, 9, and 15. In many of the specimens the groove is bounded by a ridge on each side of it; probably these ridges served to prevent the withe used in hafting from slipping. See Nos. 2, 3, 6, 9, 14. Some of the stone axes are of small size, such as Nos. 10, 11, 12.

We are told that grooved stone axes were sometimes employed as weapons in North America. "The Indians use a war club, made by bending a withe around a hard stone, of about two pounds weight, which has been previously prepared with a groove in which the withe fits, and is thereby prevented from slipping off. The handle is about fourteen inches in length, and the axe is bound to it with buffalo-hide." Stone axes were also used for felling trees and general purposes. We learn from Adair that the Southern tribes "twisted two or three hickory slips, about two feet in length, around the grooved part of the axe, and by means of this simple and obvious invention they killed trees, by cutting through the bark, and felled them by fire when they became thoroughly dry."

Schoolcraft says:—"Fire was the great agent employed in felling trees. The Indians made a fire around the doomed tree; when the fire had charred the outer surface, the burnt part was removed by the women and children, who used for the purpose a stone maul, *Agakwut*. This maul had a supple withe twisted around it, at the grooved part. The withe served as a handle. The axe-head was not mounted at right angles to the handle, as only an indrawing blow was struck. Some of these axes may

* The following axes are of greenstone :—Nos. 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16. Nos. 1 and 8 are of felstone.

have been secured more firmly to their handles, by means of wedges driven beneath the flat side, and in some instances this flattened side is slightly hollowed as if for this purpose."

A 47.

Nos. 1 to 4 are grooved stone axes, found in Ohio. Nos. 5 to 9 were found in Virginia, Nos. 10 to 13 in New Jersey, No. 14 in New York, No. 15 at Bunker's Hill, Massachusetts, No. 16 in Kentucky, and Nos. 17 and 18 in Iowa.*

The flattened side of Nos. 4 and 18 is slightly concave. No. 8 is polished in the groove, probably from the slipping of the withe handle; this polishing does not extend over the flat side, showing that the withe handle was not in contact with this part of the implement. The axe-heads having a groove carried completely round them are Nos. 5, 6, 7, 9, 11, 13, 14, 15, and 17.

No. 13 is a plaster cast of a grooved stone axe found in New Jersey; the original has attracted much attention on account of the inscription which occurs on its two surfaces. The original axe was exhibited at the annual meeting of the American Ethnological Society in 1861.

Dr. Evans mentions, in a letter dated Jan. 1, 1859, that the original axe was found near the north branch of the Rancocas Creek, Pemberton township, Burlington county, New Jersey. It was ploughed up in September, 1858, on the farm of Samuel R. Gaskill, and is said to have attracted the attention of the finder by the curious characters inscribed upon it, *the finding of the usual Indian relics being of too frequent occurrence to excite any special interest*. Mr. Gaskill is said to have deepened some of the characters in attempting to render them more distinct. The freshness of the markings consequent upon this has excited a certain mistrust of the genuine character of the inscription. Dr. Evans, however, has expressed himself as being perfectly satisfied that the characters have not been inscribed upon the axe for purposes of deception. He states that Mr. Gaskill is well known to him; that he is a man of high principle; and, moreover, that he has not sufficient knowledge of archæology to enable him to accomplish such a forgery, if it be a forgery, as

* The following axes are of greenstone :—Nos. 1, 2, 3, 4, 6, 17, and 18, found in Jefferson county, Iowa (Paris Ex., 1867). No. 12 is of compact greenstone. Nos. 5, 7, and 9 are, perhaps, of basalt-wacké. No. 8 is of hornblende. Nos. 10, 14, 15, and 16 are felstone. No. 11 is of gneiss. No. 13 is a plaster cast.

that upon the Pemberton axe. Mr. Gaskill appears to have attached no particular importance to the discovery, and he at once presented the specimen to Dr. Evans when he asked for it. The original is of a grey, compact sandstone. The inscription in parts retains the brown, decomposed appearance of the general surface of the axe; only a few of the characters, by their freshness, show the recent attempt to deepen them.

STONE ARROW- AND SPEAR-HEADS.

B 31.

Upon Tablets 1 to 3 are flint spear-heads, found in Texas. Upon Tablet 4 is a flint arrow-head, found in Missouri. Upon Tablet 5 are three flint arrow-heads, found at Warsaw, Illinois. Upon Tablet 6 are two flint arrow-heads, found in Indiana. Upon Tablet 7 are four flint arrow-heads, found in Kentucky. Upon Tablets 8 to 10 are arrow- and spear-heads of flint and milky quartz, found in Virginia. Upon Tablet 11 is a flint arrow-head, found in Pennsylvania. Upon Tablet 12 are stone arrow-heads, found in New Jersey. Upon Tablet 13 is a stone "gorget,"* found in a shell-mound† at Rockland, Long Island. Upon Tablet 14 are two flint arrow-heads, found on the bank of the Hudson river, near West Point, New York. Upon Tablet 15 are flint flakes, found in Ohio. Upon Tablets 16 to 28 are arrow- and spear-heads of flint, milky quartz, and other varieties of stone, found in Ohio.

B 32.

Upon Tablets 1 to 24 are arrow- and spear-heads of flint, milky quartz, and other varieties of stone, found in Ohio.

Of the triangular type,‡ which, perhaps, is not so elongated as in European examples, the following specimens may be noticed:—*c* Tablet 8, *b* and *d* Tablet 12, *a* Tablet 21, all in Case B 31.

Of the leaf-shaped,§ *a* and *b* Tablet 3, Case B 31; *a* and *b* Tablet 14, and the specimens on Tablets 15 and 16, Case B 32, are the most typical examples. Some of these specimens have

* See pages 127, 128.

† See page 59.

‡ See page 25.

§ See page 26.

notches in the side, towards the base, intended, no doubt, to assist in securing them to a shaft. The arrow-heads on Tablet 8, Case B 32, are believed to have been used for shooting fish. All the other specimens belong to the stemmed and barbed type.* It may be noticed that the typical stemmed American arrow-heads, such as those on Tablets 2, 3, 4, 11, 12, and 13, Case B 32, might almost be classed as "triangular, with notches at the sides," the base of the stem extends so much on each side. The comparative absence of leaf-shaped spear-heads in the Surface series, such as those found in the Mounds (see specimens in Cases C 34 to C 36), is as worthy of notice, as is the almost total absence of Surface types of spear- and arrow-heads in the Mound series.

FLORIDA.

CASES D 19 AND H 20.

D 19.

Upon Tablets 8 and 10 are some objects made from shell, found in a shell-mound, Florida. Upon Tablet 8 is a disc of shell, two inches in diameter, with a central hole; perhaps this object was intended to be worn as an ornament in a similar manner to the shell necklet from one of the Salomon Islands, in Case D 7. Upon Tablet 10 are two pendants made from the columella of some large marine shell. The fragments of shell rings, *b*, *c*, and *d*, upon Tablet 8, and the marine shells upon Tablet 9, all from New Mexico, are shown for comparison. Some of the shells on Tablet 9 are in process of manufacture. In Case D 7 are some shell armlets, from New Guinea, which serve to illustrate the rings upon Tablet 9.

H 20.

No. 2 is a cooking vessel of coarse black ware, found in Florida.

H 19.

Upon Tablet 1 are fragments of pottery found in the State of Iowa.

* See page 26.

Upon Tablets 2 to 5 are fragments of pottery from various parts of the United States.

Upon Tablets 6 to 8 are fragments of pottery, showing the impression of the baskets or mats in which the vessels were formed, United States.

H 21.

Upon Tablets 1 to 5 are fragments of pottery, slightly ornamented, United States.

Upon Tablets 6 to 7 are fragments of pottery, found in Pennsylvania.

E 9.

No. 9 is a vessel of black ware, ploughed up in the Mississippi Valley, and presented to the Collection by the Rev. E. Caswall.

CALIFORNIA.

CASES A 42 AND H 12.

A 42.

Nos. 15 to 22 in this Case are from California, and were presented to the Collection by Captain Oliver Eldridge, of San Francisco. No. 15 is a grooved stone axe, in process of manufacture from a seaside pebble, which was somewhat of the shape of the implement intended to be made from it. This pebble was rendered more symmetrical by "pecking," and a groove was worked around it by the same process. When finished, the "pecking" marks would have been more or less removed by grinding, as with Nos. 16 and 17. These axes were hafted by bending a withe around the groove. In some instances raw hide was probably placed over the withe, which, shrinking as it dried, would have held the axe-head firmly in its place. Implements and weapons hafted in this manner are still in use in North America and elsewhere. No. 20, in Case C 40, is a modern example; it was obtained by Mr. Marcou, in August, 1853, when he was crossing the prairies to the north of Texas. He procured it from the Kioways, a branch of the Comanches. The iron battle-axe, from Africa, No. 12, Case H 17, is secured

to its handle by hide, which must have been in its raw state when it was wrapped around the weapon.

Nos. 18 to 22 are stone pendants and other objects, found in a mound, about thirty miles to the south of San Francisco. No. 22 is drilled for suspension.

H 12.

Nos. 1 to 5 and No. 10 are stone mortars, used for crushing maize. These mortars are seaside boulders, which have been hollowed by "pecking." Nos. 6 to 9 are stone pestles, for use with the mortars. Nos. 1 to 9 were presented to the Collection by Captain Oliver Eldridge.

"PECKING."

The characteristic marks of this process may be detected upon many stone implements, such as pestles, mortars, hatchets, and axes. A pointed tool, of some hard variety of stone, was used for "pecking;" the tool, when in use, was held in a direction perpendicular to the surface to be worked, and not at an angle with it, as when a chisel was the tool employed.

From the number of fragments of implements which have been found, it is clear that many must have been broken in the process of manufacture. It is also evident, from the numerous unfinished specimens which have been met with, that the characteristic unsustained labour of savages caused many implements to be abandoned with careless indifference in an unfinished state, after considerable time and labour had been bestowed upon them.

Modern stone-cutters work granite and certain varieties of sandstone by "pecking." With marble and some other kinds of stone it is necessary to "lift off" chips with the chisel, instead of crushing and destroying the surface by "pecking." Holes were sometimes worked in detached masses of rock, or even, when in convenient positions, in rocks *in situ*, by the process of "pecking." These were used as mortars, in which maize was crushed. The mortice-holes in the lintel-stones at Stonehenge were, probably, worked by "pecking," for the marks of a pointed tool are to be seen within one of the mortice-holes of the fallen impost of the central trilithon. The "cup-cuttings" mentioned at pages 131 to 133 appear to have been all made by "pecking."

CANADA.

B 30.

Upon Tablet 1 are pieces of worked elk-horn; *a* is made into a chisel. Upon Tablet 2 are some bone tools; *a* and *b* are bone awls, used to pierce the birch bark for canoes, preparatory to sewing it together; *c* is a bone chisel. Upon Tablet 3 *a* is a clay bead; *b*, *c*, *d*, and *e* are bone beads, probably intended to be strung and worn as ornaments. Such specimens as *d* and *e*, however, may have been applied to other purposes, for instance, as studs or buttons. See a similar piece of bone, used as a button, attached to a New Zealand flute, No. 3, Case H 23. Upon Tablet 3 *f* is part of the stem of a smoking-pipe. Upon Tablets 4 to 9 are flint arrow- and spear-heads. The specimens upon Tablets 1 to 9 were presented to the Collection by Mr. E. A. Gaviller, of Ontario, by whom they were found. The objects upon Tablets 1 to 3 were found in heaps of ashes, upon the site of an Indian camp, county Simcoe, Ontario. The flint arrow-heads were chiefly found in county Brant. The leaf-shaped flint implement, *a*, upon Tablet 5, may be a knife; the point is too thick for this object to have been used as the head of a spear; moreover, all the evidence of wear is at the broad end. It was found by Mr. Gaviller on the Grand River, below Brantford. It may be noticed that the arrow-head, *a*, upon Tablet 7, has been worked to a *rounded* end, instead of a point. The arrow-head, *b*, upon Tablet 7, appears to have been broken and re-pointed several times; very little of the blade is left. The edge of the specimen, *b*, upon Tablet 8, is nicely serrated. Possibly *c*, upon Tablet 9, may not have been used as an arrow-head; the edges are much worn, as if from scraping bone. Upon Tablet 10 is a triangular stone arrow-head. Upon Tablets 11 to 27 are flint and stone arrow- and spear-heads.

A 42.

Nos. 23 to 27 in this Case are from Canada. No. 23 is a wedge-shaped stone hatchet, found in Upper Canada; it is very flat on the under surface, and was presented to the Collection by the late Mr. G. Witt, F.R.S. Nos. 24 and 25 are wedge-shaped stone hatchets. Nos. 26 and 27 are grooved stone axes. Nos. 24 and 25 were found in county Brant, by Mr. E. A. Gaviller, by whom they were presented to the Collection. No. 27 was presented by the late Dr. Fowler, F.R.S.

This completes the description of the Stone Age Collection in the Blackmore Museum. The Bronze objects and the Illustrative Series of modern "Savagery" will be described hereafter. The following is an outline of the present arrangement of this portion of the Collection :—

BRONZE SERIES.

IRELAND.

A 55 TO A 57.

Copper and bronze wedge-shaped celts, bronze palstaves, socketed celts, gouges, &c.

C 44 AND C 45.

Bronze spear-heads.

E 15.

Bronze knives, daggers, swords, and arrow-heads.

ENGLAND.

A 58.

Copper and bronze wedge-shaped celts, bronze palstaves, socketed celts, gouges, &c.

E 16.

Bronze daggers.

FRANCE.

A 59 AND A 60.

Copper and bronze wedge-shaped celts, bronze palstaves, socketed celts, &c.

E 16.

Bronze axes, daggers, and swords.

ILLUSTRATIVE SERIES.

A 53.

Stone hatchets and weapons from New Zealand and Australia.

A 54.

Stone and shell hatchets, from New Caledonia, Salomon Islands, &c.

C 40, E 2, AND H 4.

Hafted stone hatchets, from British Guiana, New Zealand, Australia, Society Islands, Hervey Islands, &c.

C 40, C 41, AND E 3.

Stone-tipped arrows and spears, from the neighbourhood of Behring's Straits, Alaska, California, New Caledonia, &c.

E 4, H 13, AND H 14.

Bone-tipped arrows and spears in use by the Esquimaux, &c.

H 12.

Examples of the use of sharks' teeth for arming weapons, from the Kingsmill Islands, &c.

H 18, AND R 12 TO R 14.

Iron-tipped spears and arrows, from various parts of Africa, &c.

C 40 AND H 17.

Iron swords, daggers, knives, and axes, from various parts of Africa, &c.

H 9.

Masks and paddles from the north-west coast of America.

R 8.

Paddles, clubs, darts, blow-tubes, &c., from British Guiana.

H 23 AND R 11.

Chiefs' staves, hatchets, paddles, and other objects, from New Zealand.

R 2 AND R 6.

Paddles from the Society Islands.

H 8.

Clubs from the Friendly Islands.

H 3, H 15, AND R 1.

Spears, clubs, boomerangs, and shields from Australia.

H 9 AND H 10.

Spears, darts, clubs, and shields, from the Salomon Islands.

R 3.

Paddles and clubs from the Marquesas Islands.

R 4 AND R 5.

Darts, bows, and paddles from New Guinea.

R 7.

Spears and clubs from the Fiji Islands.

R 9 AND R 10.

Spears, clubs, paddles, &c., from various Polynesian and Melanesian localities.

D 7.

Examples of the use of shell for ornamental purposes.

D 6.

Examples of the use of shell and bone for making fish-hooks, &c.

D 5.

Bone skin-scrapers, and other objects in use by the Esquimaux.

D 4 AND D 5.

Examples of the use of ivory and the teeth of animals for ornamental purposes.

FORGERIES.

D 2 AND 3.

In these Cases forgeries of flint implements are shown ; many

of which were made *to order* by Flint Jack. A photographic likeness of this individual, taken when he was at Salisbury, in 1863, is shown in Case D 2. Much has been written about Flint Jack by Mr. Monkman, Mr. Wyatt, Mr. Llewellynn Jewitt, and others.

Mr. Evans has mentioned a distinction to be observed between counterfeits and forgeries:—"Counterfeits, *contrafacta*, being made to imitate genuine originals; forgeries, *fabricata*, though professing to be genuine, not being of necessity imitations, but frequently embodying new conceptions." A glance at the specimens in Cases D 2 and 3 will suffice to convince the visitor that he is looking at *forgeries*, not at *counterfeits*, for there is scarcely a single example which is a good imitation of a genuine original. In particular, the absence of "surface-chipping" upon the arrow-heads will be noticed. See specimens upon Tablets 18 to 23, 27 to 29, and 33 and 34, Case D 2.

Many "amateur" forgers can make equally good, if not better, flint hatchets, arrow-heads, and scrapers than Flint Jack and his professional brethren. There were heroes before Agamemnon, and forgers of flint implements before Flint Jack. About the year 1855, "there was a manufactory of stone hammer-heads, *ancient* British urns, and flint weapons of all descriptions on the eastern coast of Yorkshire, principally carried on by one William Smith, *alias* Skin and Grief, or Snake Willy. Not only arrow-heads and celts of all sizes, but rings, knives, saws, and even fish-hooks of flint were produced, some of which have been engraved as genuine in local archæological publications. Since then the manufacture has spread southwards, and many are made in Suffolk. They have also been produced in Kent, and recently the most accomplished of the forgers, Edward Simpson, *alias* Flint Jack,* has made more than one public exhibition of his skill in flint-working in London. The fabrication of stone antiquities is carried on, but on a smaller scale, in the north of Ireland. There is usually a greater difference in the convexity of the two faces of the forged flint arrow-head than in the genuine examples; and in nearly all the forgeries a dulness of surface characteristic of recent fracture.

"On the Continent forgery has been practised in connection with the lake-dwellings of Switzerland, both with regard to

* In Yorkshire, Flint Jack was at one time better known by the name of "Bones."

objects in stone and in bone. Even the antiquities found in the cave deposits of France have not entirely escaped. Ancient stone implements have been socketed into ancient bones, so as to give them handles, and the result has been modern forgeries composed of genuine antiques. Even amongst the most ancient relics of human workmanship with which we are acquainted—the flint implements found in the valley-gravels of England and France—the forger has been at work; and Icklingham in Suffolk, and Amiens and Abbeville in France, have each produced their own schools of counterfeiters. The forged flint implements from Amiens* are usually of the long spear-head type; those from Abbeville† are generally flatter, with a cutting edge all round, and ovato-lanceolate in form; those from Icklingham‡ are usually sharply pointed, flat on one side and convex on the other. Of course there are varieties of form, but at all these places they are usually produced for sale enveloped in some clayey matrix, so as to conceal the character of their surface, unless some portion of an ancient surface of flint has been left in chipping them out, in which case the old surface§ is sometimes wiped clean, and the new left covered with mud. It is only after a thorough washing that they appear in their true colours.

“There is generally something in the form of the recent forgeries which strikes the practised eye; the method of chipping is different, the angles between the different facets sharper, and the edge also sharper, than is usual with genuine specimens. The surface is commonly dull and lustreless; and if a portion be chipped off there is no perceptible difference between the recent fracture and the rest of the surface.”

NATURALLY FRACTURED FLINTS.

The specimens Nos. 33 to 56, Case D 3, are naturally frac-

* See Case D 3, Tablets 1, 10, 14, and 21 to 24.

† See Case D 3, Tablets 3, and 6 to 8. Upon Tablet 30 is a clumsy forgery made by the workmen at Porte Marcadé. Nos. 2 and 4, Case D 3, are forgeries made by the workmen near Paris; as are also the forgeries of neolithic types, Nos. 2 and 13, Case D 2.

‡ See Case D 3, Tablet 15, and Case D 2, Tablets 24 and 25. No forgeries have hitherto been attempted by the Salisbury workmen.

§ The forgery upon Tablet 19, Case D 3, shows both old and new surface; it is a naturally fractured flint *improved* by the forger. A patch of old crust (patina) is to be seen on No. 24, Case D 3.

tured flints, collected and shown from the resemblance which they bear *in outline* to the implements fashioned by human art.

MODEL OF PIT-DWELLINGS NEAR SALISBURY.

In Case A 61 is a model of the first group of pit-dwellings discovered at Highfield, near Salisbury;* scale an inch and a half to the foot. The part marked "Disturbed soil" had been trenched; the white indicates undisturbed chalk; the yellow, undisturbed gravel. In the same Case is a model of some pits, found near Quimper, in Brittany, shown for comparison. This last model is to the scale of an inch to four feet.

* See pages 18—21.

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